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OVERDOING COÖPERATION.

UNDER the stress of cut prices on proprietary articles, the increase of physicians dispensing and the multiplication of medicaments that can be profitably produced only in large establishments, many retail druggists have been lead to experiment with various cooperative plans for manufacturing or purchasing a portion of their supplies, for procuring fire insurance, and for other services by which they hoped to either reduce their overhead expenses or increase their profits on sales, or both.

The object was to substitute the old individualism, with its motto of "every fellow for himself, and the devil take the hindmost" (which he usually did), by the new plan of joining effort, capital and initiative, and mutually sharing the resulting benefits.

Some few of these cooperative enterprises have been conspicuously successful, and through wise and economical management have developed into institutions of considerable size and have accumulated resources that insure their continuance and responsibility. They have given their cooperating shareholders real and substantial service, have enabled them to reduce the fixed charges of doing business, have added to the margin of profit on goods sold, and in short have justified the faith of their founders by accomplishing exactly what they set out to do.

So well established as part and parcel of the retail drug business have some of these institutions become that no one is likely to challenge their right to existence as long as they deal justly with retailers who are non-stockholders, and with the other established branches of the legitimate drug trade, and provided also that they are true to label, and are not merely cooperative around the edges for the profit of a few thrifty individuals near the center of control.

Numerous others of these enterprises have been equally conspicuous as fail-

ures, either because their management was entrusted to the loudest talkers or most enthusiastic of their members, who endeavored to make noise and enthusiasm take the place of adequate capital and sound business judgment, or because of various other reasons that need not be mentioned.

As in gold mining and other hazardous enterprises, however, the many failures have been forgotten and only the few successes are remembered. The possibility of success in a properly conducted cooperative undertaking having been demonstrated, the movement in that direction has been greatly accelerated, and the rush of druggists to connect themselves with cooperative schemes of all kinds once more illustrates the common tendency of men to go in droves, and to do what other men are doing.

The doubting Thomases who refused to have anything to do with the original undertakings while they were in the experimental stage have swung from over-caution to over-confidence and are fairly falling over one another in their anxiety to connect themselves with anything that looks like a cooperative enterprise or that is labeled as such by its promoters.

Many of these are foredoomed to failure, and many of those which do not fail absolutely, to a precarious existence. They must glean in a field that has already been passed over by the earlier concerns, and in order to gain a foothold will need to put forth far greater efforts than were required of their predecessors.

Not only will their own success be problematical, but they will jeopardize the success of the existing concerns, for whether intended by their founders to be competitive or not, they must from force of circumstances become direct competitors of those already in the field, and to that extent diminish the opportunities for the successful continuance of the latter.

This is overdoing cooperation. It is traveling back over the road to the competition of individualism, to escape the evils of which the cooperative movement was inaugurated, for there is nothing to distinguish excessive competition between cooperative societies from excessive competition between partnerships, corporations or other kinds of commercial units.

Nor does it appear that this excessive multiplication of cooperative enterprises is at all necessary in order to serve the retailer in the way that cooperation is intended to serve him. The essential quality of true cooperation is not to earn excessive dividends on stock, but to secure reliable and economical service for the stockholder.

If it is necessary to become a stockholder in order to secure the service desired, the retailer can still procure stock in the established concerns, and even if required to pay a much higher price for it than when it was in the experimental stage the price, in most cases, will be no more than its original cost plus accumulated earnings, and hence the purchaser is getting all he pays for, without the risk which the original investor was required to assume.

Certainly it would be better, far better, to have a comparatively limited number of sound and conservatively managed concerns with widely distributed stock and ample surplus, and able to render certain and adequate service, than a multitude of small concerns of limited capital, giving slender and uncertain services and

of questionable responsibility, and liable by their failure to bring the entire co-operative movement into disrepute.

It is a problem well worth pondering over.

It is possibly an old fashioned and out-of-date theory, but until I learn of stronger reasons against it than any I have yet heard, I shall hold to the faith that the best cooperation, and that which will best serve the drug trade as a whole is that wherein the manufacturer, the jobber and the retailer, while co-operating within their respective classes for their own profit shall also cooperate honestly and heartily with each other for the welfare of all.

J. H. BEAL.

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A CRITICISM OF AMERICAN MEDICAL EDUCATION.

SEVERAL years ago Abraham Flexner, working under the auspices of the Carnegie Institution, made a report upon the conditions prevailing in the medical schools of this country that proved to be a disagreeable surprise to those of us who had flattered ourselves that American medical educational methods were on a par with the best of European models.

In a recent number of the *Atlantic Monthly*, (Nov., 1913) he returns to the charge, and under the caption, "The German Side of Medical Education," makes a comparison of German and American medical schools that is far from flattering to the institutions of the Western Continent.

Of the German institutions he has little to say that is not complimentary, while of the American schools his remarks are almost wholly condemnatory, though here and there he admits that a few American institutions are not as bad as most of the others, and that in recent years there are some slight signs of improvement.

Speaking of the possibility of sampling the American system as a whole, he says:

"It is even a question whether such a hodgepodge as American medical education is really capable of being sampled or represented at all."

Referring to the fact that our students go to Germany and that German students do not come to us, and the reason for this one-sided movement we read that:

"Until, however, eager foreigners begin to flock to American schools for the purpose of continuing their studies, it is extremely likely that the one-sided movement of American students to Germany will be construed by laymen to mean that they find something there which is not found with equal ease and in equal abundance in the medical schools of their own land.

"To what is this superiority, if such it be, due? It is to be attributed in the first place to the fact that a wise and powerful government has drawn a sharp line below which no medical school can live."

Admitting that there are differences in quality among German institutions he comes perilously near to saying that even the worst of them are equal to our best, as for example:

"But for us the important point is that the differences never cut below a cer-

tain well-marked and lofty level. In respect to the educational qualifications of its students, in respect to the intelligence and capacity of its teachers, in respect to general laboratory and clinical facilities, every medical school in Germany surpasses and far surpasses, what any state in America lays down as the minimum requirement. There is, I repeat, no uniformity; but not in all Germany is there a feebly equipped or a feebly manned medical school, or a heterogeneous body of medical students. How high the minimum standard is in all these respects I will try to make clear by stating that on the minimum standard on which a medical school can live in Germany, over three-fourths of the medical schools of the United States and Canada would be at once stamped out of existence."

In speaking of American state supervision of medical education we are told that:

"The only American state which possesses a department of education somewhat resembling that of a German state is New York. The home of the Department of Education in Albany is rather more imposing than that of the Prussian Department of Education in Berlin; and the New York department also has large powers. The difference is that the Prussian department uses its powers and the New York Department, despite improvements in recent years, does not; in the city and state of New York, medical schools still exist which are utterly incapable of fulfilling respectably the purpose for which they purport to have been established; and schools in other states are recognized, despite equal or greater defects. That is to say, in the one American state in which an agency has been created for the maintenance of a decent minimum, the decent minimum is not yet maintained; still less so in other states."

Discussing the German student's liberty of choice of studies, or what we term the elective system, it is said that:

"A nation of educational 'spoon-feeders,' such as, alas, we in this country are, may well stand aghast at this free-and-easy treatment. I am myself inclined to think that the German arrangement is needlessly chaotic and wasteful; but I have no quarrel with the full responsibility which it throws upon the already well-disciplined medical student. The German instructor is not a probation officer dealing with children in their early twenties. He provides a rich and abundant fare. He could not provide this rich and abundant fare if his strength had to be exhausted in police duty, in quizzing, drilling, and marking. The two things of course hang together. Where there are well-trained students, there may in the years of maturity come full responsibility. If the student body were incompetent, the university professor would have to degenerate into a 'school marm,' as is frequently the case in our country."

How the American schools check the student's liberty of action at the wrong time, and also overload him with a burden of required subjects that he is unable to bear is set forth as follows:

"I am not concerned now to criticise these arrangements. I wish simply to draw attention to them by way of contrasting them with the martinet spirit which prevails the moment his liberal education is completed and the student begins to attack a subject in which he is really interested. That is the moment that we Americans select for tying him hand and foot: once he enters the medical school,

he is, for the most part, committed to a four years uniform grind, precisely as if it were known just what he ought to learn and as if the curriculum-makers knew it. The necessary subjects and parts of subjects are specified, as is the number of hours that he must devote to each. Routine is so exacting that the average medical student is not quite equal to it, and the better student is quite used up by it. Instead of furnishing opportunity and stimulus for development, the American medical school closes down upon the enterprising student, long inured to academic freedom, with an exhausting and depressing uniformity.

"This phenomenon is closely connected with another previously pointed out. Our laws—or their lax enforcement—permit the continued existence of weak medical schools. The public interest demands that their graduates be as well trained as possible. The states have endeavored, by precise specifications as to what the student must be taught, how and how long, to force inherently poor schools to be better than it is in their nature to be. Some poor schools have been thereby made so uncomfortable that they have desisted; a few have improved slightly; but the good schools have been harmed, and medicine and medical science have been deprived of initiative and originality. The Germans, surveying our situation, taunt us good-humoredly; they recall our pride in being a 'practical people.' 'Would not a truly practical people reach the end by forbidding the incompetent rather than by crippling the competent?' I have been frequently asked."

In discussing the hampering arrangements between hospitals and our medical colleges, and the alleged improvement in this respect in recent years we are told that:

"To no small extent, the improvement is as yet mainly on paper. More serious still, our clinical heads—mainly unproductive men—are far from hospitable to young workers. Where the chief is not himself a productive scientist, obvious considerations make it inexpedient for him to open the doors wide to ambitious and original advanced students.

"The truth is that the clinical teacher in the German sense hardly exists as yet in America at all. As contrasted with Germany, American teaching of medcine, surgery, and obstetrics, and so on, cannot properly be called professional teaching. Our professors of the clinical subjects, with exceptions so few as to be numerically negligible, are practitioners who make no effort to create the scientific or academic atmosphere and environment characteristic of the German clinic. The university spirit is missing in the clinical half of the American medical school. Let us not deceive ourselves on this score. We are paying the price of long-continued and still-continuing exploitation of clinical teaching."

In connection with the same subject, and illustrating the eagerness of medical practitioners for professorial dignities it is related that:

"An amusing example of total incapacity to appreciate the ridiculous has recently been furnished by a New York institution. In order to avoid being lowered in classification by the Council of Education of the American Medical Association, certain influential members of this medical faculty undertook to introduce certain improvements,—itself a situation which could not arise in Germany. The university authorities refused to carry out the bargain, whereupon the members in question resigned. Did this affect the school? Not a bit. The vacant

places were at once filled with practicing doctors. I venture to say that the incident could be repeated indefinitely, and the faculty kept full none the less.

Mr. Flexner accounts for the superiority of German methods of medical education as follows:

"The essential features which have contributed to the greatness of German medicine may then be concisely formulated as follows: First, the high minimum level of organization and equipment, below which the government will permit no medical school to live; second, the prolonged and serious secondary-school training which is absolutely, without exception, exacted of every student in the medical faculty; third, the freedom of the German university, which gives the professor the strength and leisure to work and encourages the capable student to do more than the minimum requirements of the curriculum for graduation; finally, the high respect in which the practising profession holds the teaching profession, and the custom of calling teachers freely from university to university."

If American medical education is ever to reach the level of the German standards we are told that:

"Those schools which cannot now meet them, or soon hope to meet them, ought not to be allowed to go on contributing their quota of immature and ill-trained practitioners to a medical profession whose general average is already probably below the lowest to be found in any other great modern nation."

It will be remembered that several years ago some rash individual proposed to the American Conference of Pharmaceutical Faculties that it should invite the Carnegie Institution to make an examination of the American schools and colleges of pharmacy. The invitation was not extended; but should such an examination ever be made—and should Mr. Flexner draw up the report—we may look for what the late Mr. Horace Greely would have termed "some mighty interesting reading."

J. H. BEAL.

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PREPARING FOR THE SIXTY-SECOND MEETING.

PLANS have been pretty well decided upon now for the Detroit meeting of the American Pharmaceutical Association. The meeting will be held on the week beginning Monday, August 24. The Hotel Pontchartrain will be the headquarters. This hotel is admirably suited to the purpose.

It has a convention floor up at the top of the building, with eight or ten rooms of various sizes, thus being well adapted to an organization like the A. Ph. A., which is split up into so many sections and auxiliaries of one kind and another. Furthermore, the convention floor of the Pontchartrain is so high up that it is away from the dirt and noise of the street on the one hand, and on the other is subjected to the cooling breezes from the river.

The Detroit meeting, indeed, is going to be delightfully cool and pleasant. Detroit is not at all like the usual American city—hot and stuffy in the summer. It is located on the Great Lakes, gets the benefit of the water breezes, and is furthermore a city of great beauty and charm. Thousands of people go to Detroit annually to spend their summer vacations instead of frequenting the

customary resorts. It is a city that everybody wants to visit who hasn't already seen it, while the man who has seen it is not satisfied until he can return to it again.

Many delightful features are planned for the convention. There will, of course, be the customary reception and ball on Monday evening. On Wednesday, from 4 to 6, there will be a reception for the ladies. The afternoon and evening of Thursday will be devoted to a boat-ride tendered by Parke, Davis & Co., and many of the attractive spots will be viewed that have helped to make the environs of Detroit so noted. On Friday there will in all probability be an auto-

HOTEL PONTCHARTRAIN, DETROIT.
Official Headquarters of the 62d Convention.

mobile ride to the parks and to the famous shore drive around Lake St. Clair. Other contemplated entertainments are a smoker for the men, and either a theater party or a ride to Bois Blanc Island for the ladies. Of course smaller entertainments for the ladies will be sandwiched in all through the entire week.

Detroit has come to be a great manufacturing center—famous in three particulars. In the manufacture of drugs, stoves and automobiles Detroit unquestionably leads the world. It may be that some of those in attendance upon the convention will want to visit industrial plants in various lines. Thus, for instance, ten or fifteen people may want to go through the Ford or the Cadillac or the Packard automobile factory. Others may want to visit the Solvay Process

SCENE IN BELLE ISLE PARK, DETROIT.

DETROIT BOAT CLUB, BELLE ISLE PARK, DETROIT.

Works or any one of a hundred other interesting places in the city. It is expected that arrangements will be made for a number of small trips of this kind if sufficient interest is shown by the members. It is up to them. If you are interested please write now to the local secretary so that he may get an idea of what is wanted. Address your letter to Leonard A. Seltzer, 32 Adams West, Detroit, Mich.

It may be interesting to state, too, that certain reforms are going to be inaugurated at the Detroit meeting in the conduct of the convention business. All the sessions will be held in the day time, and the evenings will be left free for rest, recreation and enjoyment. The Council, only, will meet at that time, and this will give a chance for the Sections to begin their work in the morning promptly at 9:30. Mr. Seltzer, the local secretary, is working out a plan of bulletin-boards so that a member who is sitting in one Section may know what is going on in others at the same time, thus making for a maximum of interest. Promptness will be exercised all along the line, and there is every expectation that the Detroit meeting will be a hummer!

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THE A. PH. A. BUTTON.

AT the Nashville meeting, the production of a distinctive American Pharmaceutical Association button was authorized. The design selected is a gilt edged button having a shield in blue enamel edged with gold on a white field with gilt letters A. Ph. A. in English text across the shield.

This button should be worn by all members of the Association and will serve as an introduction to fellow-members. It should become the insigne of the professional standing of pharmacists.

The buttons made in double gold plate with rolled gold shoe and hard enamel will be supplied to members at 25c apiece. A limited number of 8 carat gold buttons have been ordered and these will cost the members $1.00 apiece.

Every member should promptly order one of these buttons and wear it on every convenient occasion. Specify whether you want the backing to be the regular screw or a jewellers catch pin. Send all orders to

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Scientific Section

Papers Presented at the Sixty-First Annual Convention

COMPARATIVE ACTIVITY OF VARIOUS SPECIES AND VARIETIES OF DIGITALIS.

F. A. MILLER, M. S. AND W. F. BAKER, B. S., M. D.

But few of the many species and varieties of the genus Digitalis have been examined for comparative toxicity, Paschkis (1) claims that Digitalis ambigua contains the same constituents as Digitalis purpurea and that the medicinal properties of the two are the same. Goldenberg (2) concludes that all species exert the same action on the heart of a frog as the infusion of Digitalis purpurea, but differ considerably in the energy of their action. He says that Digitalis eriostachys and Digitalis glandulosa are only slightly active and that Digitalis fontanesii is extremely feeble. Digitalis nervosa he finds to be 1.5 times and Digitalis ferruginea even 10 times more active than purpurea. This is indeed a small number of species upon which to formulate conclusions for a genus consisting of twenty-three or more species and numerous varieites. Boudgest (3) has examined Digitalis grandiflora which is synonymous with Digitalis ambigua and says that it possesses activity as a cardiac remedy which is fully equal to that of Digitalis purpurea.

This leaves a large number of species and horticultural varieties which have not been investigated for comparative medicinal value. For this reason as well as to gain more information upon the effects of cultivation, soils, geographical distribution and time of collection it was thought desirable to examine samples of as many species and varieties as could be obtained. Only samples from plants grown under uniform conditions and from seed of known source were used in the experiment. Catalogues from the most prominent seedsmen and nurserymen of the United States, England, Germany, and Japan were examined and all the species and varieties listed by them were obtained for planting. The first of these plantings were made as early as December, 1911, and the others extended through January, February, March, and April of 1912.

All seed were germinated in the greenhouse in seed pans filled with sterile soil. Other precautions were taken to guard against accidental mixture of seed. The small seedlings were transplanted to flats as soon as the second leaves had made their appearance. They were retained in the greenhouse in these plant flats until weather conditions would permit of their being transferred to cold-frames. Transplanting from the cold-frames to the open field commenced May 10th and continued without interruption until all plants were transferred. All varieties were grown in the same field upon a uniform soil consisting of clay loam. Cultivation was thorough, frequent, and continued throughout the growing season.

With few exceptions the various forms were grown in uniform plots of one fortieth acre, requiring two hundred and sixty-four plants each. Leaves for the purpose of testing were collected seven months from the date of seed germination. The last collections were made September 19th. With two exceptions all samples were collected from non-flowering plants. The samples consisted of all the leaves from ten representative plants of each plot. These were dried either at room temperature or in a hot air oven at one hundred degrees centigrade. They were immediately reduced to a number sixty powder and sealed in amber bottles until tested. The following table gives the species or variety, source of seed, date of germination, manner of curing, and effective dose as obtained by the frog-heart method of Cushny.

ARRANGED ACCORDING TO NATURAL OR BOTANICAL RELATIONSHIP.

Species or Variety.	*Source of Seed.*	*Germination.*	*Manner of Drying.*	*Effective Dose.*
Digitalis purpurea	Watkins & Simpson, England..	12-1-11	100° C.	0.0009
" purpurea	From wild plants, Oregon.....	12-14-11	Room temp.	0.0009
" purpurea alba	A. T. Boddington, New York.	2-15-12	100° C.	0.0005
" purpurea rubra	A. T. Boddington, New York.	2-15-12	Room temp.	0.00045
" purpurea rosea	A. T. Boddington, New York.	2-15-12	Room temp.	0.0004
" gloxiniæflora purpurea	A. T. Boddington, New York.	2-10-12	Room temp.	0.00045
" gloxiniæflora lilicina	A. T. Boddington, New York.	2-14-12	100° C.	0.0005
" gloxiniæflora rosea	A. T. Boddington, New York.	2-15-12	Room temp.	0.0006
" gloxiniæflora rosea	Henry A. Dreer, Philadelphia.	1-19-12	100° C.	0.0006
" gloxiniæflora alba	A. T. Boddington, New York.	2-15-12	Room temp.	0.0019
" alba	Watkins & Simpson, England..	12-1-11	100° C.	0.0007
" monstrosa	Watkins & Simpson, England..	2-15-12	100° C.	0.0008
" monstrosa	Henry A. Dreer, Philadelphia.	2-15-12	Room temp.	0.00055
" gloxinioides	Horsford's Nurseries, Vermont	2-16-12	Room temp.	0.00045
" maculata iveryana	A. T. Boddington, New York.	1-25-12	100° C.	0.0005
" ivery's spotted	D. M. Ferry & Co., Michigan.	3-11-12	100° C.	0.00085
" purpurea maculata superba..	Ernest Benary, Germany.....	4-1-12	Room temp.	0.0005
" mixed	J. A. Salzer, Wisconsin.....	3-18-12	100° C.	0.00075
" sp.	Yokohama Nursery Co., Japan.	3-18-12	100° C.	0.0009
" sibirica	Horsford's Nurseries, Vermont	12-28-11	100° C.	0.00055
" buxbaumii	Ernest Benary, Germany.....	4-1-12	Room temp.	0.0005
" gloxiniæflora lutea	A. T. Boddington, New York.	2-13-12	100° C.	0.0005
" lutea	Ernest Benary, Germany.....	4-1-12	100° C.	0.00065
" macranthus	Ernest Benary, Germany.....	4-1-12	100° C.	0.0008
" macranthus (flowering).....	Ernest Benary, Germany.....	4-1-12	100° C.	0.0005
" ambigua	Horsford's Nurseries, Vermont	12-29-11	100° C.	0.00055
" ambigua (flowering).....	Horsford's Nurseries, Vermont	12-29-11	100° C.	0.0006
" grandiflora	Henry A. Dreer, Philadelphia.	2-19-12	100° C.	0.0009
" lanata	Horsford's Nurseries, Vermont	12-28-11	100° C.	0.0004
" lanata	A. T. Boddington, New York.	2-19-12	100° C.	0.0003
" canariensis	Watkins & Simpson, England..	1-15-12	100° C.	0.0005

The foregoing table shows a variation of 84 percent in the effective dose as determined for the thirty-one samples. With few exceptions closely related forms show little uniformity in toxicity. The varieties which have originated from the species purpurea (Numbers 1 to 19) show a variation of over 75 percent. Contrary to all expectations the highest value was obtained from lanata, a species, quite distinct from purpurea. Gloxiniæ flora alba a purpurea strain gave the lowest value. Eighty-three percent of the total number of samples tested indicate a greater toxicity than the official purpurea. Compared with average digitalis leaf, 55 percent of this number exceed the commercial article as indicated by the effective dose.

With two exceptions all samples were collected from non-flowering plants. These exceptions were the synonymous forms, ambigua and macranthus, from which it was possible to collect samples from both the flowering and non-flowering plants. Macranthus shows a greater toxicity in the flowering stage while ambigua shows practically the same value for both the flowering and non-flowering plants. It is of interest to note that the species purpurea from England, Ore-

gon, and Japan have the same indicated value. The Japanese form which was supplied as Digitalis sp. proved upon flowering, to be one of the purest forms of Digitalis purpurea under investigation.

In this respect there is much uncertainty as to the nomenclature of the purpurea group and many of the varieties now recorded will doubtless be reduced to synonymy. Many of these varieties consist of a conglomeration of types which must be isolated and cultivated as pure strains before they will possess further value for experimental purposes.

The narrow leafed forms, represented by such species as canariensis ambigua, lutea, and lanata have been found true to name and reproduce themselves in pure stand. Synonymy also exists in this group but the classification will be easier than in the broad leafed forms. A thorough systematic investigation of the whole genus will be necessary before further work can be done upon the comparative medicinal value of the various species and varieties.

In conclusion it may be pointed out that accurate botanical investigations should precede or accompany any comparative investigations of this group of plants; that the results indicate that good digitalis leaf may be obtained from the first year flowerless plants; that cultivation in itself does not lessen toxicity and, that valuable forms other than purpurea may be found among the many species and horticultural varieties not hitherto investigated.

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DEPARTMENTS OF BOTANY AND EXPERIMENTAL MEDICINE, ELI LILLY & COMPANY, Indianapolis, August, 4th, 1913.

INFLUENCE OF HEAT AND METHOD OF STORING UPON THE POTENCY OF DIGITALIS LEAVES.

CHAS. C. HASKELL AND F. A. MILLER.

Two points of much interest to the pharmacist and to the physician are the most desirable methods of curing and preserving digitalis leaves.

It is important to know whether the use of a moderately high degree of temperature is permissible, because, if such be the case, rapid drying can be accomplished and the theoretical, injurious enzyme destroyed and dependence upon favorable atmospheric conditions can thus be obviated.

Hart[3] finds that subjecting the leaves to an "excessive temperature" caused a loss in activity of 25 percent. Unfortunately, he does not state what this temperature was. Hale[2], using dried leaves (moisture content of about 10 percent), concluded that the strength of the leaves, as determined by Cushny's method, is unaffected by a temperature up to 120° C., but that a temperature of 140° C. for two hours has an injurious action.

Our experiments were carried out upon leaves from conservatory grown plants of Digitalis gloxiniæflora. These plants were eight months old when tested, and in some instances a sufficient supply of leaves was secured from each plant to

enable us to carry out all comparative tests on a single plant, thus eliminating the possibility of variation due to individual plant differences.

The leaves, after drying were reduced to No. 60 powder and tinctures were made, using 75 percent alcohol as a menstruum. These tinctures were tested by Cushny's frog method and in a few cases the lethal dose for guinea pigs also was determined. In testing upon guinea pigs, the alcohol was not removed.

EXPERIMENT I.

Digitalis Gloxiniaeflora, Single Plant.

No.	Dried at	Frog Assay.	Guinea Pig Assay.
B-1115	120° C. 4 hours	0.0055	0.002 0.0025
B-1116	50° C. 24 hours	0.0055	0.0030
B-1117	35° C. 5 days		
	40° C. 3 hours	0.0050	0.025

EXPERIMENT II.

Digitalis Gloxiniaeflora, Single Plant.

No.	Dried at	Frog Assay.
B-1124	120° C. 12 hours	0.0065
B-1128	80° C. 5 hours	0.0065

The frog heart assays of these samples give values near those secured with similar samples of Digitalis purpurea. The extremely high toxicity for guinea pigs is explainable by the menstruum used. It has been our experience that an alcoholic menstruum of 75 percent enables the percolation of a tincture much more toxic for guinea pigs but not much stronger on frogs than one made with 50 percent alcohol.

From these experiments, it seems safe to conclude that a temperature of 120° C. applied to green leaves causes no greater loss in toxicity or ability to influence the frog's heart than does a temperature of 40° C.

There is apparently little agreement as to the keeping qualities of dried digitalis leaves exposed to the air. Focke[1] claims that one month is sufficient time for a considerable loss in strength to occur when the leaves are exposed to the air and contain more than 1.5 percent moisture. Pratt[5] reaches somewhat similar conclusions. Hale[2] on the contrary, finds that leaves containing from 5.8 to 9.4 percent moisture are very active at the expiration of one, two, three and eight years, respectively. Hatcher and Eggleston[4], also, have been unable to see that digitalis leaves from three to five years old are any less potent than fresh samples.

Our own experiments bearing on this point have extended over only one year, but it seems that the additional evidence they present justifies their being reported.

The remainder of sample B-1124, which had been dried at 120° C. for twelve hours and gave a frog value of 0.0065 was divided into two portions, B-1129 and B-1130. These two portions were placed in wide-mouthed amber bottles, one being carefully stoppered and sealed with paraffin, while the other was closed with a loosely-fitting plug of absorbent cotton.

EXPERIMENT III.

Digitalis Gloxiniaeflora, Single Plant.

No.	Method of Storage.	Original Assay.	Assay 12 Months Later.	Moisture.
B-1129	Open Bottle	0.0065	0.006	5.43
B-1130	Sealed Bottle	0.0065	0.006	2.31

The remainder of sample B-1128, dried at 80° C. for five hours, which originally tested 0.0065, was divided into two portions, B-1131 and B-1132, and stored in a manner similar to that described above.

EXPERIMENT IV.

Digitalis Gloxiniaeflora, Single Plant.

No.	Manner of Storage.	Original Assay.	Assay 12 Months Later.	Moisture Content.
B-1131	Open Bottle	0.0065	0.0055	6.04
B-1132	Sealed Bottle	0.0065	0.0060	2.83

A third sample was secured by collecting leaves from several different plants of Digitalis gloxiniæflora. These leaves were dried at 30° to 55° C. for twenty hours; reduced to a No. 60 powder and gave a value of 0.006. Two lots were stored as in the preceding experiments.

EXPERIMENT V.

Digitalis Gloxiniaeflora, Several Plants.

No.	Manner of Storage.	Original Assay.	Assay 12 Months Later.	Moisture Content.
B-1134	Open Bottle	0.006	0.006	5.92
B-1133	Sealed Bottle	0.006	0.006	4.76

From these experiments, it is safe to conclude that in one year no deterioration occurred in our samples of leaf, irrespective of the manner of storage, even when the moisture content was as great as 6.04 percent.

In some instances, a higher value is secured on the second assay than was obtained on the fresh leaf. This is to be explained by the limits of experimental error inherent in the assay method, as in all except one case, this difference does not amount to 10 percent.

DIGITALIS LEAF.

1. Focke: Arch. d. Pharm., 1903, Vol. 241, p. 128.
2. Hale: Bull. No. 74, Hyg. Lab., U. S. P. H. and M. H. S.
3. Hart: Pharm. Jour., Vol. 26, p. 440.
4. Hatcher and Eggleston: Druggists' Circular, Vol. LVII, 1913, No. 6, p. 325.
5. Pratt: Bos. Med. and Surg. Jour., Vol. 163, p. 279, 1910.

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INFLUENCE OF SOIL COMPOSITION ON MEDICINAL PLANTS.

F. A. MILLER, M. S.

Observations upon the influence of soil composition on medicinal plants have been made by several investigators. These observations have indicated that certain variations may occur in the percentage of active principles when the growing plants are subject to different soil conditions. Agriculturists have long recognized the influence of soil composition upon crop production. Their methods of measuring this influence, however, have differed from those employed with medicinal plants. Results have usually been determined by amount of total crop produced and not by chemical and biological assay. Recently some work has been done upon the chemical determination of certain constituents such as oil,

sugar, and protein, as a means of following this influence. A combination of these methods would be essential to the best results with medicinal plants.

Hooper (1) demonstrated this fact by his work upon Jalap. He found that by using superphosphate at the rate of 1600 pounds per acre, he could bring about an increase in the dry weight of tubers produced as well as an increase in the percentage of resin. While the increase in resin by this treatment was only 24 percent the increase in dry weight was 86 percent. Other investigators have given more attention to percentage of active principles than to crop production.

Carr (2) contends that although the addition of manure to a soil already suited to the growth of belladonna is no disadvantage and may be slightly beneficial, yet where large quantities of nitrogenous fertilizers are employed somewhat lower percentages of alkaloid are observed. This condition he attributes to the larger growth which results from such manuring. The author does not summarize his results with farmyard manure, nitrate, calcium cyanamide, basic slag, superphosphate, and potash. He concludes, however, by saying that in whatever latitude belladonna is grown, it will doubtless be found that the composition of the soil, the use of fertilizers, and seasonal conditions make for small variations. During the four years that he continued his experiment the results were not taken uniformly according to the fertilizers used.

Ransom and Henderson (3) have studied the effect of kainit, superphosphate, sodium nitrate, potato mixture, basic slag, and combinations of these upon yield of green weight and percentage of total alkaloids in belladonna. In their conclusions they state that although they have not obtained sufficient evidence that the percentage of alkaloid in the dried leaf is materially altered by artificial manures, it would appear that in several cases the yield of green plant per acre has been largely increased. They further state that it would also appear that in the case of belladonna it is useless to hope that the drug shall possess anything approaching uniformity in medicinal potency, even when carefully collected and dried. It would seem that we are entirely too young in this work to make predictions of what the future may or may not disclose. The possibilities of obtaining uniformity in cultivated belladonna have hardly been touched upon and will not be known until the numerous problems of propagation and breeding have been thoroughly investigated. No efforts worthy of mention have as yet been made to produce a strain or variety of belladonna which will exhibit a uniform yield of alkaloids.

Chevalier (4) records data indicating an increase of nearly 60 percent of total alkaloids in belladonna when treated with nitrogenous fertilizer in combination with manure. Acid phosphate and potash produced no increase.

Tschirch (5) makes the broad, general statement that an increase in the amount of valuable constituents has been affected in the case of almost all cultivated plants.

To gain more information upon the influence of soil composition upon medicinal plants, experiments have been performed, using digitalis, stramonium, and belladonna. These experiments have been performed both in the open field and in the greenhouse with various commercial fertilizers and soils of different mechanical mixture. Precautions have been taken to secure uniform conditions in selecting locations of plots and in the collection and curing of samples.

Digitalis. The plants for this experiment were grown from seed obtained in Oregon from wild plants. They were germinated December 8th, 1911, in the greenhouse, transplanted to flats and retained in the greenhouse until March 19th, 1912, when they were transferred to cold frames of double glass construction. Strong, hardy plants were thus obtained, eight hundred and seventy-five of which were used in the experiment. These were transplanted to the open field May 10th, 1912. Clean cultivation was practised throughout the summer. The plot was located in an apple orchard between two rows of trees upon a soil which had been cropped to potatoes for several consecutive years without fertilization. The plot was divided into six equal parts and the fertilizers applied at the rate of six hundred pounds per acre. The nitrate of soda was divided into three equal portions and applied at intervals of two weeks. The fertilizers were not applied until the plants were well established. They were then distributed by hand as uniformly as possible about the plants of each plot and immediately worked into the soil by cultivation. Mixed samples were collected for assay in early September, 1912, and cured at 100° centigrade. The following table gives the fertilizers used and the comparative results as obtained by the one hour frog heart method for assaying digitalis leaf.

Plot No.	Sample No.	Fertilizer Used.	Assay.
1	B-1232	Nitrate of Soda	0.0065
2	B-1233	Sulphate of Potash	0.0062
3	B-1234	Normal Fertilizer	0.0060
4	B-1235	Acid Phosphate	0.0062
5	B-1236	Nitrate of soda, Sulphate of potash (equal parts)	0.0060
6	B-1237	Control	0.0062

Little or no effect can be attributed to the use of these commercial fertilizers upon digitalis. This is evident from the fact that the difference in the comparative value of the samples from the different plots as indicated by the above figures is less than the possible experimental error.

Stramonium. The effects of a normal fertilizer upon the percentage of total alkaloids in stramonium when applied at the rate of 600 pounds per acre have been previously noted (6). The average results obtained are repeated below.

DATURA STRAMONIUM.

No Fertilizer.	Fertilizer.	No Fertilizer.	Fertilizer.
0.50%	0.61%	0.60%	0.64%

DATURA TATULA.

No Fertilizer.	Fertilizer.	No Fertilizer.	Fertilizer.
0.49	0.54	0.62	0.68

Belladonna. It is not only desirable to know the effects of commercial fertilizers upon medicinal plants but also the effects of various types and mixtures of soils. Only in this manner can the growth requirements of these plants be determined and their cultivation intelligently recommended. An open field experiment was performed upon first year belladonna plants using sodium nitrate, potassium sulphate, acid phosphate, and a normal fertilizer. The plants were started in the greenhouse March 8, 1912, from seed taken from a commercial shipment of crude belladonna leaves, assaying 0.62 percent total alkaloids. All

fertilizers were applied July 15, when the plants had reached a height of from twelve to twenty inches. They were applied by hand as uniformly as possible and immediately worked into the soil by cultivation. The total amount of sodium nitrate used was divided into three equal portions and applied at intervals of two weeks. All the fertilizers used were applied at the rate of six hundred pounds per acre. No commercial fertilizer other than stable manure had been used upon these plots for a period of at least twelve years. The samples for assay were collected September 19, 1912, from representative plants of each plot. The following results were obtained:

FIRST EXPERIMENT.

Plot No.	Sample No.	Fertilizer Used.	Assay.	
			Leaves.	Root.
1	B-1258	Sodium Nitrate	0.699%	0.510%
2	B-1259	Potassium Sulphate	0.858%	0.504%
3	B-1261	Acid Phosphate	0.911%	0.380%
4	B-1260	Normal Fertilizer	0.835%	0.575%
5	B-1262	Control	0.688%	0.420%

The results of the first experiment indicate that marked changes may be produced in the percentage of alkaloids through the application of certain commercial fertilizers. However, sufficient data have not been obtained to justify any statement concerning the regularity of these changes. It is not known whether the changes indicated are due to the direct or indirect action of the fertilizers and what their influence would be when applied to different types of soils, under varied climatic and meteorological conditions. The extent of the error as introduced by individual plant variation in an experiment of this kind is also not known but must be considerable. Ten individual plants from this plot showed a variation of 50 percent. True (7) in examining individual plants has found this variation to be as much as 70 percent.

Disregarding this possible source of error, the increase in percentage of total alkaloids in the leaf as indicated by these trials is 20 percent for potassium sulphate, 24 percent for acid phosphate, and 18 percent for the normal fertilizer, the sodium nitrate causing no change. The increase in the root is 18 percent for sodium nitrate, 17 percent for potassium sulphate, 27 percent for the normal and a decrease of 9 percent for acid phosphate.

To further test the effect of sodium nitrate and acid phosphate upon percentage of alkaloids another experiment has been performed upon second-year plants. It was hoped in this experiment to eliminate the factor of individual plant variation in percentage of alkaloids. To accomplish this, fifteen uniform plants were selected and marked with conspicuous tags. These were divided into three groups of five plants each, leaving considerable space between each of the three groups. All weeds were removed from around these plants and the soil thoroughly cultivated and pulverized. Before applying any fertilizer, samples were collected from the three groups of plants. In collecting these samples care was taken to obtain an equal number of leaves from each plant of a given group, and that these leaves should be of uniform size. This same proceedure was followed in collecting the samples after the fertilizers had been applied. In this manner and by the utilization of the same plants throughout the

experiment it is believed that the individual characteristics of the plants have been obviated and that the results should be more accurate than where no attention is given to the proportion of samples from different plants or to the utilization of identical plants throughout the experiment. After the original samples were collected plots number 1 and 2 were given a liberal application of sodium nitrate and acid phosphate, respectively. Plot number 3 received no fertilizer. After an interval of two weeks plots 1 and 2 were given a second application. At the end of another two weeks period samples were collected for assay in the manner designated. At this time the fifteen plants were removed from the soil and the principle roots from all plants of each group were taken for assay. At the beginning of the experiment a root sample was taken from three plants which were growing near the control group. Rain occurred after both applications of fertilizers thus insuring immediate availability.

SECOND EXPERIMENT.

Samples collected before applying fertilizers.

Plot No.	Sample No.	Fertilizer Used.	Assay Leaf.	Assay Root.
1	B-1624	Potassium Nitrate	0.558%	
2	B-1625	Acid Phosphate	0.569%	
3	B-1626	Control	0.598%	
	B-1627	Control, 3 plants		0.385%

Samples collected after applying fertilizer.

Plot No.	Sample No.	Fertilizer Used.	Assay Leaf.	Percentage Increase in Leaf.	Assay Root.
1	B-1712	Potassium Nitrate	0.724%	23%	0.345%
2	B-1713	Acid Phosphate	0.742%	23%	0.345%
3	B-1714	Control	0.724%	18%	0.322%

The results indicate a considerable increase in the percentage of alkaloids in the leaf samples from all plots. The percentage increase in the fertilized plots is but little greater than that in the control. Practically no change is indicated in the alkaloidal content of the root samples.

The third experiment upon belladonna was carried on in the greenhouse with soils of widely different types. The plants used in the experiment were obtained by vegetative propagation from individuals of known alkaloidal yield. These individual plants were field grown and were selected at random. Cuttings were made from them and placed in a propagating bed filled with sand. As soon as strong roots were developed the plants were potted in two-inch pots, using a loam soil. They were later transferred to four-inch pots. December 16, 1912, they were removed from these and after all soil was carefully washed from the roots they were placed in six-inch pots which had previously been filled with the different types of soils. In addition to the potted plants, ten were grown on a greenhouse bench, filled with rich fibrous loam.

All the plants made very poor growth during the winter, due to the low temperature of the greenhouse which was essential to the success of propagating work, being done at that time. The experiment was brought to a close September 7, 1913, and on account of their small size it was necessary to use the entire plants for assaying. The proportions of root to stem and leaves were about the same in all cases. On account of the presence of roots in the assay samples the

results would be expected to run lower than those of the original plants. The soils used in the experiment were as follows:

No. 1. From field in which original plants were grown.
No. 2. Equal parts clay and No. 1.
No. 3. Equal parts clay and sand.
No. 4. Equal parts clay and leaf mould.
No. 5. Leaf mould.

The clay was obtained from an excavation eight feet below the top soil. Sand was used in number 3 to improve the physical condition of the clay. The leaf mould consisted of well decayed vegetable substance obtained from a woodlot of mixed growth.

The following table gives the number of the original plants from which the vegetative cuttings were made, soil and sample numbers, percentage of total alkaloids as determined upon leaf samples from the original field grown plants. All numbers of the same denomination in the first column refer to the same original plants from which the cuttings were made. A complete series from each of these original plants was started in the different soils but many of them were lost before the completion of the experiment.

The results indicate a considerable decrease in percentage of alkaloids in all plants examined, regardless of soil treatment. Even when grown upon the same soil as the original plant the decrease has been as great as from 20 percent in

THIRD EXPERIMENT.

Number.	Soil Number.	Sample Number.	Assay.	Assay, Original Plant.
10	1	B-1664	0.351%	0.820%
10	2	B-1665	0.373%	0.820%
10	4	B-1666	0.364%	0.820%
13	3	B-1667	0.351%	0.870%
13	4	B-1668	0.382%	0.870%
13	5	B-1669	0.323%	0.870%
13	Bench	B-1670	0.498%	0.870%
13	Bench	B-1671	0.396%	0.870%
13	Bench	B-1672	0.477%	0.870%
14	1	B-1673	0.441%	0.664%
14	2	B-1674	0.365%	0.664%
14	Bench	B-1676	0.383%	0.664%
15	1	B-1677	0.283%	0.600%
15	Bench	B-1678	0.471%	0.600%
15	Bench	B-1679	0.501%	0.600%
15	Bench	B-1680	0.442%	0.600%
16	1	B-1681	0.412%	0.516%
16	Bench	B-1682	0.398%	0.516%
16	Bench	B-1683	0.436%	0.516%
17	1	B-1684	0.454%	0.616%
17	2	B-1685	0.404%	0.616%
17	3	B-1686	0.370%	0.616%
17	4	B-1687	0.412%	0.616%
17	Bench	B-1688	0.373%	0.616%

number 16, to 57 percent in number 10. Where two or more plants from the same individual parent were grown in the uniform soil on the greenhouse bench a variation is noted of from 9 percent in number 16, which is only slightly greater than the experimental error, to 20 percent in number 13. On the other hand, such widely different soils as number 1 and 4 produced a difference in alkaloidal

yield of only 4 percent in plants from number 10, and 9 percent in those from number 17, and 8 percent on soils 3 and 5 in plants from number 13. After allowing 5 percent for experimental error there is little difference in favor of soil influence in the foregoing instances. The results as a whole indicate that further work is necessary on the influence of soil composition upon medicinal plants, before any generalizations can be made. The second experiment indicates that seasonal variations in alkaloidal percentage may have to be investigated more thoroughly. In this instance the percentage of alkaloids in the control plants increased nearly as much as in the fertilized plants. Also the influence of the two fertilizers, though apparently slight, seem to be identical with reference to the percentage of alkaloids. It is believed that there have been considerable sources of error in most of the work upon soils and fertilizers. It is desirable in this respect to first locate these sources of error and then attempt to eliminate them before proceeding further upon the problems of soil composition.

LITERATURE CITED.

(1) Hopper: Pharm. Jour., July 11, 1896.
(2) Carr: Proc. 8th International Congress of Applied Chemistry, 1912, 17, 7.
(3) Ransom and Henderson: Proc. 8th International Congress of Applied Chemistry, 1912, 17, 63.
(4) Chevalier: Comptes Rendus, 1910, 150, 344.
(5) Tschirch: Pharm. Jour., 1909, 83, 420.
(6) Miller and Meader: The Assay of Individual Plants of Datura Stramonium, Datura Tatula, and Other Species and Varieties, presented at the semi-annual meeting of the American Chemical Society, March, 1913.
(7) True: Oil, Paint and Drug Reporter, 1911, 80, 29.

BOTANICAL DEPARTMENT, ELI LILLY & Co., Indianapolis, August 16, 1913.

FURTHER STUDY OF THE ALKALOID GELSEMININE.

L. E. SAYRE.

In previous papers read before this Section by the writer on the alkaloids of Gelsemium, it will be seen that there has been a progressive study of the uncrystallizable alkaloid, named by Thompson, Gelseminine.

The attempt has been to bring this alkaloid into such a state of purity that it will be available for making an ultimate chemical analysis.

The present year's work has been that resulting from an investigation of the alkaloids from 50 pounds of the crude drug. From this 50 pounds, there was obtained in an unpurified condition 21.5 gms. of Gelsemic acid, 75.7 gms. of crude Gelsemine and 36.4 gms. of crude Gelseminine, making in all 112.1 gms. of crude alkaloids and 21.5 gms. of crude Gelsemic Acid.

The effort in the present year's investigation was to purify the gelseminine for physiological testing and for the comparison with the alkaloid gelsemine. It should be stated in passing that hitherto we have found it very difficult to rid gelseminine absolutely from the contaminating impurity, gelsemine. We have found the separation of the two alkaloids to be made more complete by treating the crude gelseminine hydrochlorid first with alcohol which separates out most of the gelsemine hydrochlorid. The alcoholic extractive resulting from the evaporation of the alcoholic filtrate is now re-dissolved in acetone and a further separation of gelsemine hydrochlorid is possible.

By treating the extract resulting from the evaporation of the acetone solution of gelseminine hydrochlorid with water and precipitating the solution

with a slight excess of ammonium hydroxide, the precipitate, after washing, is dissolved in diluted sulphuric acid, and re-precipitated with ammonium hydroxide and the resulting precipitate washed until free from sulphates. This precipitate, when dried in a desiccator was a light brown powder apparently free from resinous and gummy material. This was the product mentioned in the physiological experiments in the following paper.

Since Dr. Chillingworth's experiments, we have been able to further purify gelseminine and we have separated this substance into two parts,—one more highly colored and weaker, the other very much lighter and stronger in physiological action.

During the next year, we shall continue this investigation and have strong hopes of bringing the so-called gelseminine into such a state of purity that it may be analyzed for its elementary chemical constituents.

The gelsemine used by Dr. Chillingworth was a purified product resulting from the purification of the alkaloid obtained from this year's lot of drug. It was perfectly white, and apparently free from any of the uncrystallizable coloring matters or uncrystallizable alkaloids.

PHYSIOLOGICAL STUDY OF GELSEMINE AND GELSEMININE.

F. P. CHILLINGSWORTH, M. D., PHARMACOLOGIST, UNIVERSITY OF KANSAS.

In this paper I will adhere strictly to the physiological action of the alkaloids of gelsemium. For the chemistry and preparation of these active principles consult F. A. Thompson,[1] L. E. Sayre,[2] E. D. Reed,[3] Kimberly, Robertson and Vanderkleed,[4] and L. E. Sayre.[5]

We will first take up the physiological actions of gelsemine and gelseminine in detail and later will draw our conclusions.

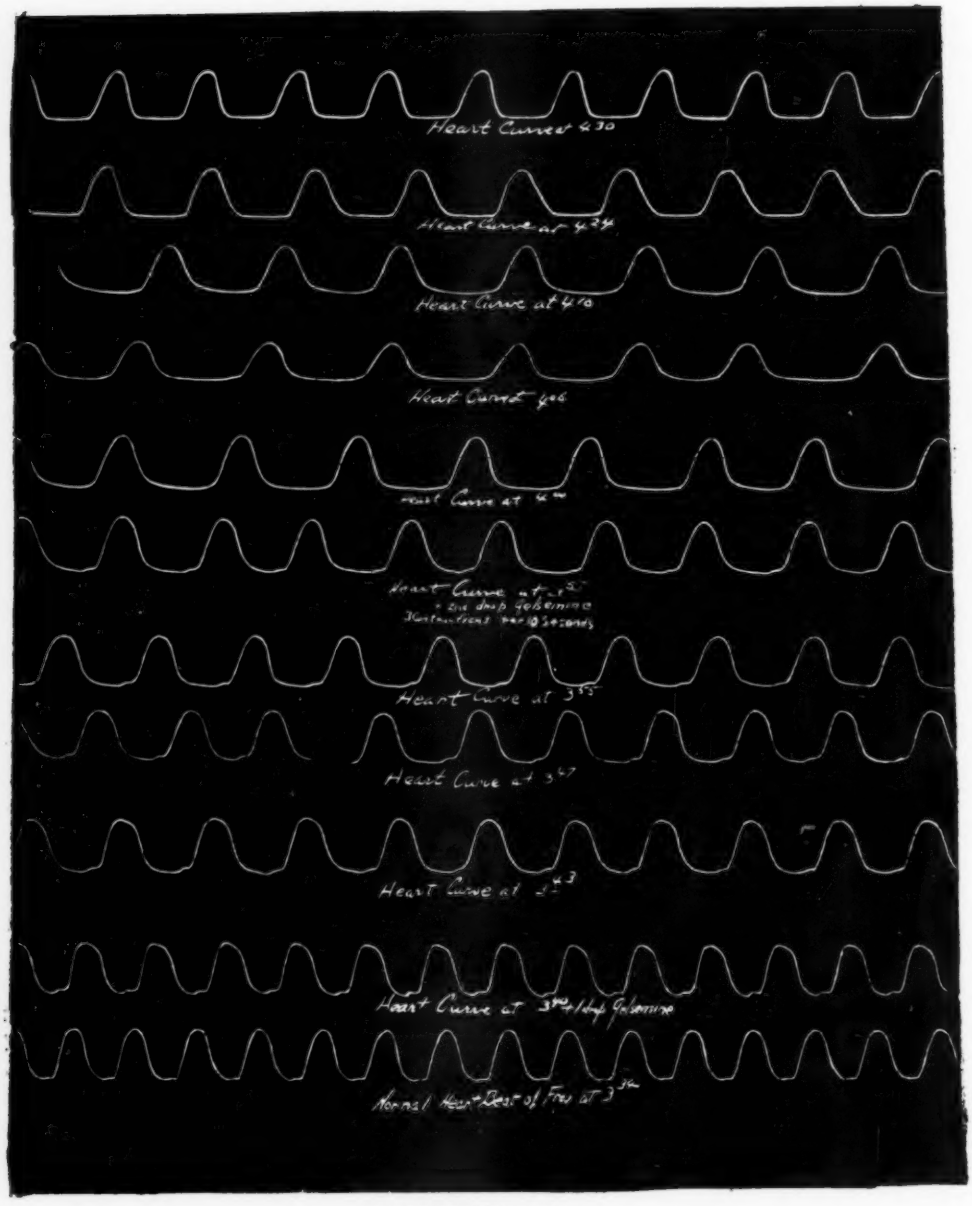
Throughout these experiments two standard solutions were used (one of the active principle gelsemine and the other of the active principle gelseminine) so made that one cubic centimeter of the solution equalled .001 gram of the alkaloid.

Our results though not extensive enough to serve as a basis for far reaching conclusions, nevertheless are of enough importance perhaps to add to the observations of others, and we hope suggest certain lines of experimentation which might be followed up to good advantage.

The two standard solutions referred to above were prepared for us by Prof. L. E. Sayre, Dean of the School of Pharmacy at the University of Kansas. This being the first time that the two alkaloids of Gelsemium have been successfully isolated in the pure state.

The literature on the action of these alkaloids is very confusing and unsatisfactory. Prof. C. Binz, of Bonn, is by far the clearest on this subject and we cannot do better than to quote in brief: "Gelsemium paralyzes the motor centers of the brain as well as the respiratory center in the medulla oblongata. Sen-

[1]Thompson, F. A.: Phar. Era, 1887, page 3.
[2]Lloyd Library: Sept., 1910.
[3]Proc. A. Ph. A., 1908, page 855.
[4]Jour. A. Ph. A., 1912, April.
[5]Jour. A. Ph. A., 1912, May.


Heart Curve at 4.30
Heart Curve at 4.24
Heart Curve at 4.10
Heart Curve at 4.06
Heart Curve at 4.00
Heart Curve at 3.53
+ 2nd drop Gelsemine
Heart Curve at 3.53
Heart Curve at 3.47
Heart Curve at 3.43
Heart Curve at 3.34 + 1 drop Gelsemine
Normal Heart Beat of Frog at 3.34

EXPERIMENT No. 1.

sibility remains intact, and the irritability of the muscles and the motor nerves is retained. Death is produced by paralysis of respiration." Bartholow states that, "Gelsemium dilates the pupils owing to paralysis of the circular fibers."

Recently Prof. Sayre contends that the actions of these two alkaloids are not the same and that the action of one often masks the action of the other.

Experiment No. 1. Frog—weight 35 grams. Showing the true action of the alkaloid gelsemine upon the frog's heart.

Time	Rate	Remarks
3.34	60	Normal.
3.40	60	One drop of gelsemine applied to the heart.
3.43	52	Gradual slowing with increasing diastole, systole still complete.
3.47	50	No marked change.
3.55	46	Heart continues to slow.
3.57	44	Second drop of gelsemine applied.
4.00	36	Here is best seen the action of this alkaloid.
4.06	30	Slowing most marked at this time, systole less complete—diastole prolonged.
4.15	36	Beginning recovery of tone of heart. Rate picking up.
4.30	46	Shows continued recovery of heart from gelsemine.

This experiment shows the typical action of gelsemine, it also shows that its action is not as intense as that of gelseminine—in other words the alkaloid is not as powerful. It is to be noted that here we employed two (2) drops of the preparation to get definite results. Also the absolute recovery of the heart (in about twenty-five minutes suggests that the action is not lasting.

Experiment No. 2. Frog—weight 37 grams. Showing the true action of the alkaloid gelseminine upon the frog's heart.

Time	Rate	Remarks
2.20	65	Normal.
2.24	60	One drop of gelseminine applied to the heart, note immediate slowing.
2.27	54	Slowing more marked.
2.31	50	Systole failing, diastole more marked.
2.35	48	
2.40	40	Tendency to stay in diastole.
2.45	28	Here we find the heart dropping a beat. Rate and output much decreased.
2.47	24	
2.52	20	
2.54	18	Typical gelseminine action.
2.59	14	Characteristic pauses between systole.

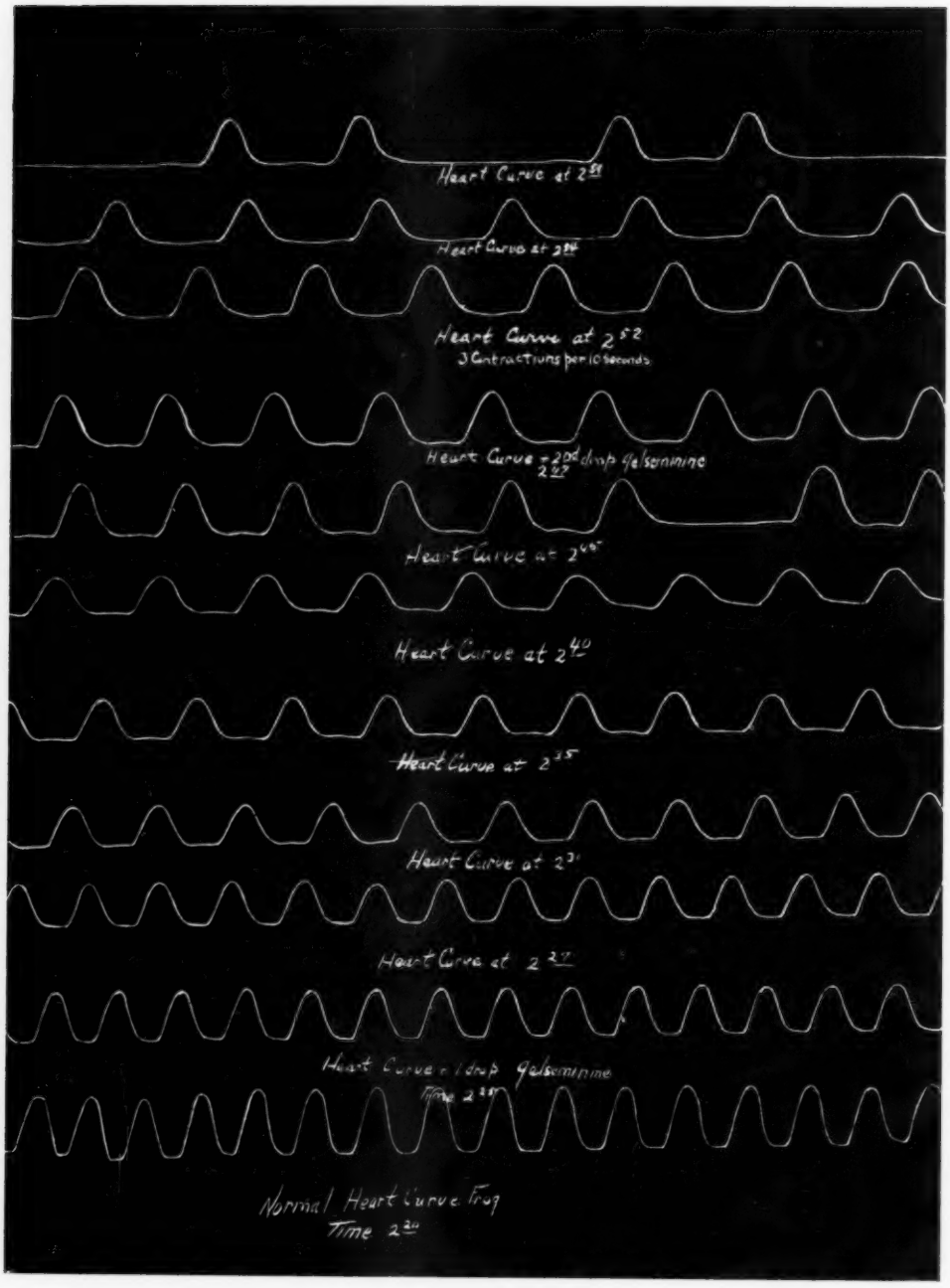
This experiment shows the intense action of the alkaloid gelseminine upon the heart. However it must be borne in mind that this action is via the central nervous system and not as might be first supposed to direct action upon the cardiac muscle.

This primary action upon the nervous tissues we will dicuss later on.

Experiment No. 3. Turtle (medium.) Showing typical gelseminine action upon the heart.

Time	Rate	Remarks
10.55	60	Normal.
10.57	..	One drop of gelseminine applied to the heart.
10.59	50	Slowing of ten beats per minute obtained in two minutes.
11.00	50	
11.04	28	Marked slowing: Systole very imperfect, diastole slightly prolonged.
11.06	25	See above.
11.10	20	Rapid failure of heart in all its phases.
11.14	20	
11.18	00	Heart stopped in diastole.

This record is of especial interest in that it is a well known fact that the


Heart Curve at 2 51
Heart Curve at 2 54
Heart Curve at 2 57
3 Contractions per 10 seconds
Heart Curve + 20 drops Gelsemine
2 57
Heart Curve at 2 40
Heart Curve at 2 40
Heart Curve at 2 35
Heart Curve at 2 31
Heart Curve at 2 27
Heart Curve + 1 drop Gelsemine
Time 2 20
Normal Heart Curve Frog
Time 2 20

EXPERIMENT No. 2.

heart of a turtle will stand violent abuse—in fact Howell states that after complete stoppage of the heart by electrical stimulation it can be made to resume beating and will recover at the end of four hours.

One drop of gelseminine as is shown in this experiment will completely stop the heart of the turtle in exactly twenty-three minutes, thus showing the marked strength of this alkaloid.

Experiment No. 4. Frog—weight 31 grams. Showing the action of the alkaloid gelsemine on the living frog.

Time	Remarks
3.35	Injected fifteen drops of gelsemine solution into dorsal lymph sac.
3.37	Movements retarded slightly.
3.38	Stimulation required to produce movements.
3.40	Can still retract both legs.
3.42	Cannot swim.
3.43	Respiration is rapid: seems to retain air in lungs.
3.45	Foam at mouth: respirations sixty per minute.
3.46	Reflexes still O. K.
3.48	Same condition.
3.52	Respiration is slower and irregular: hard to count.
3.55	Same condition.
3.58	Abdomen opened: stomach distended with air.

Here we see for the first time the toxic action of gelsemine, caused by the large injection (15 min.) of this alkaloid. In this experiment the heart rate was sixty beats at the end of the experiment, showing that even in toxic doses, the heart of the frog is not affected by gelsemine. Furthermore the sole site of action was centered upon the respiration through the respiratory center of the medulla. This experiment suggests that this solution must be applied direct to the heart in order to produce slowing.

Experiment No. 5. Frog—weight 36 grams. Showing the action of the alkaloid gelseminine on the living frog.

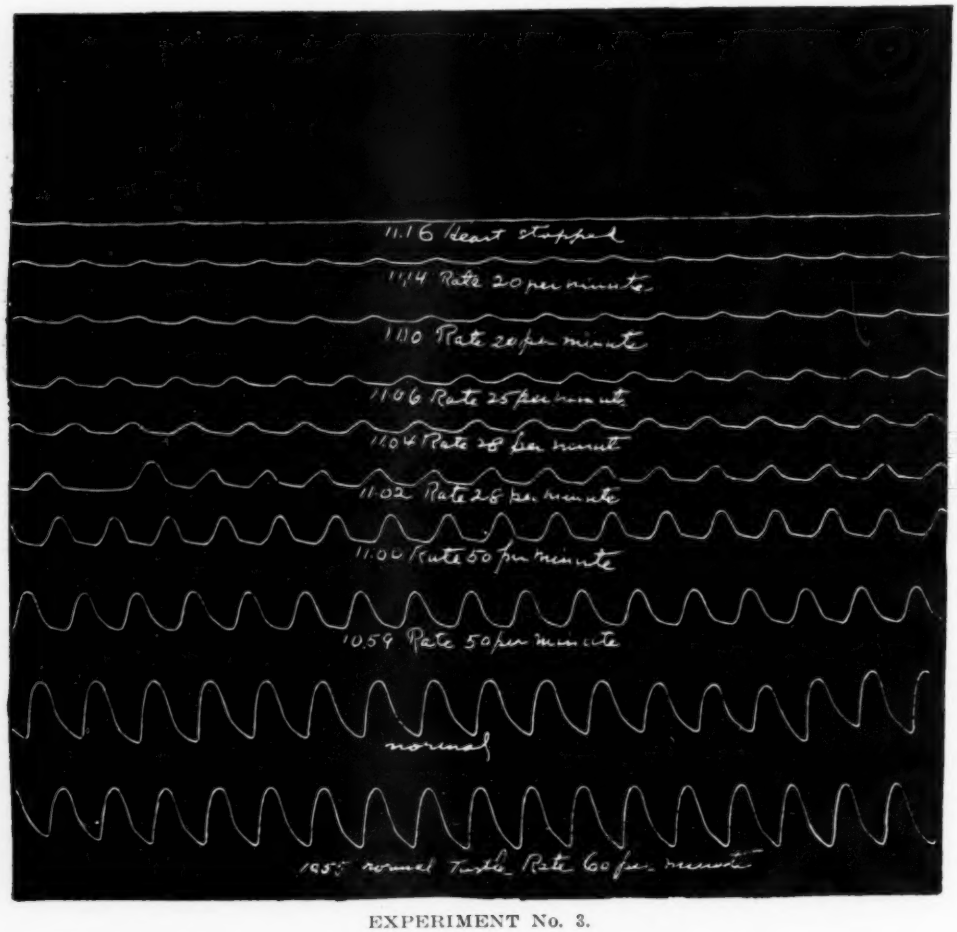
Time	Remarks
2.22	Injected seven drops of gelseminine solution into dorsal lymph sac.
2.23	Movements retarded at once.
2.24	Same.
2.25	Cannot retract the legs.
2.30	Cannot swim.
2.31	Respiration upset: rapid and very irregular: retains air in the lungs and stomach.
2.32	No attempt to recover when placed on back. All power of motion lost.
2.33	Fibillary twitchings.
2.35	Swallows often when trying to breathe.
2.37	Abdomen opened: frog died at 2:36: stomach distended with gas(due to swallowing movements). Abdominal organs greatly congested. Heart stopped in extreme diastole.

The full meaning of this experiment is best obtained by comparing it with Exp. No. 4. Noting that only one half as much alkaloid was used and that at the end of the experiment the frog was dead, also note the condition of the heart and the early loss of the reflexes.

It will be seen then that here we get marked depression from the start and that again the site of action is upon the respiratory center. We must also observe the muscular twitchings caused by this toxic dose of the alkaloid gelseminine.

Experiment No. 6. Dog—weight 15.5 K. Showing the effect of gelseminine upon blood pressure. A. C. E. mixture used.

The carotid artery was dissected out and connected by means of a glass cannula to an upright glass tube. This cannula had previously been filled with a saturated solution of magnesium sulphate to prevent clotting. The column of blood was next allowed to remain stationary in the tube for five minutes at the end of which time five (5) drops of the gelseminine solution was injected into the jugular vein. Three (3) minutes later we observed a direct fall in blood pressure amounting to fifty (50) mm. of Hg.


11.16 Heart stopped
11.14 Rate 20 per minute
11.10 Rate 20 per minute
11.06 Rate 25 per minute
11.04 Rate 28 per minute
11.02 Rate 28 per minute
11.00 Rate 50 per minute
10.59 Rate 50 per minute
normal
10.57 normal Table Rate 60 per minute

EXPERIMENT No. 3.

Ten minutes later a second injection of five (5) drops was given and we again obtained a drop in blood pressure of twenty (20) mm. of Hg. It will be noted that this dog was not given the customary dose of morphine in order that this factor should not enter into our conclusions.

In Experiment 7 a second dog was used as above but we replaced the gelseminine with gelsemine, using twice the dose used in Exp. No. 6. After the total injection of twenty (20) drops of the gelsemine solution we noted a fall in blood pressure amounting to but 12 mm. of Hg. Here again we see the difference in action.

In results of this nature this question naturally presents itself—where is the action located? Is it in the muscle itself or is it in the central nervous system.

We believe we have answered this question in the following experiment. A frog was pithed in the usual way and next the thigh muscles of one leg were ligated, care being taken to leave the great sciatic nerve free.

The alkaloid was now injected as before into the dorsal lymph sac and the results carefully noted. After a short period of quiescence, sudden fibrillations were noted in both legs. This fact, supported by the fact that in all our experiments the respiration failed long before the heart beat, confirms in a way the earlier investigators, and tends to show that the action of these two alkaloids is primarily upon the central nervous system. The action on the heart and blood pressure we likewise explain through the inhibitory influence carried by the vagi. The dilatation of the eye we attribute to the nervous relaxation of the circular fibers.

CONCLUSIONS.

1. From the evidence at hand it is evident that the action of these alkaloids is upon the central nervous system, and that the action upon the heart is secondary via the vagi.

2. Furthermore as will be seen by examining experiments No. 1 and No. 2, the strength of the alkaloid gelsemine is only about one fourth as great as that of gelseminine, also that the action in the case of gelseminine is much more lasting and profound. Again, these two alkaloids seem to have but little action in common.

3. The therapeutic value of these alkaloids has doubtless been overlooked; and now that they are to be obtained in the pure state their definite action will be utilized.

I wish to express my sincere thanks to my assistant, Mr. L. R. Hoffman, for his valuable aid.

BE AN ORIGINATOR.

Every tub should stand on its own bottom is a homely old proverb, but it is just as true now as when first spoken. Why should an intelligent druggist seek to imitate some successful preparation instead of trying to make one better? If the success of the article is due to good advertising and has merit, then the men who put their brains and money into it deserve their success and reward. If it is a fraud and is successful only because of the credulity and ignorance of the people, the druggist should shun it and not try to grab a few dollars by trailing behind the band wagon with a feeble imitation. It never pays. It is a mighty small man who is satisfied with the crumbs from the table; a real man wants to sit at the table himself, and this means that every druggist should be an originator, not an imitator. The follower always gets the leavings, the leader gets the prizes and the honors.—*American Druggist.*

Section on Pharmacopoeias and Formularies

Papers Presented at the Sixty-First Annual Convention

CONCERNING SOME OF THE PROPOSED ADDITIONS TO THE NATIONAL FORMULARY.

W. S. AMOS, PH. G.

When the formulas proposed for inclusion in the National Formulary were first made public the writer prepared a number of samples, of most of the elixirs, the two spirits, antiseptic solution of pepsin, aromatic castor oil, four tinctures liquid petroxolin, iodine petroxolin, one fluidextract and the fluidglycerates.

These preparations have been kept on a shelf in a room having a north exposure and at ordinary room temperature. Over a year has passed since they were made.

Compound spirit of cardamom made May 15, 1912, has darkened slightly and contains a slight precipitate. The taste suggests pimenta.

The writer made a sample of spirit using oil of pimenta, and from it an elixir which are superior to the spirit and elixir made as directed in the proposed formulas.

The compound spirit of vanillin made May 15, 1912, has darkened in color to a light brown; there is no precipitate.

Compound elixir of almond made May 15, 1912, has darkened slightly. The odor is that of orange flower water—"heavy" and unpleasant, the taste is at first pleasant but weak—afterwards that of the orange flower water and vanillin combination.

Aqueous elixir of licorice made May 15, 1912, has kept perfectly. We would suggest that the fluidextract of licorice of the formula be replaced by the fluidglycerate to be in keeping with the title, which suggests no alcohol.

Red elixir does not contain enough color and it is suggested that the amount of cudbear be doubled, so that the elixir may be diluted, as in prescription work, and the color still be noticeable.

Compound elixir of cardamom (made May 15, 1912) is cloudy, with precipitate. The taste is not unpleasant, but is too weak. The remarks above under spirit of cardamom will apply to this elixir.

Compound elixir of vanillin (made May 15, 1912) has darkened to a caramel brown. The taste is not pleasant. We consider this the poorest elixir of any proposed.

Elixir of three bromides has kept well but compound elixir of almonds is not a good vehicle for the bromides; sweetened water would do as well.

Compound elixir of sodium salicylate contains a precipitate and the taste is objectionable. It should not be included as proposed in the new formulary.

We made no samples of the formates elixirs; we do not believe there is demand enough for them to justify their inclusion in the National Formulary.

Antiseptic solution of pepsin (made Jan. 25, 1912) contains a slight precipitate, taste strongly acid—the odor indicates that the pepsin is old. The name "Physol" suggests a nostrum. Reject antiseptic solution of pepsin.

Liquor carbonis detergens should be admitted—but the directions for making it should be changed. The coal tar should be macerated in tincture of quillaja.

The writer has made several gallons of this preparation and has observed that coal tar is not soluble in the alcohol and forms a coating over the quillaja, so that the alcohol cannot act upon the latter.

Aromatic castor oil is a good preparation and is in demand; a slight increase in the oil of cinnamon is advisable. We suggest also that the kind of oil be definitely prescribed, as there is quite a difference between the flavor of oil of Ceylon cinnamon and oil of cassia, the latter being the most commonly stocked by druggists.

Syrup of poppy could well be replaced with a syrup of morphine hydrochloride. We would then have something definite, the elixir of morphine hydrochloride seems to be a preparation of value and is quite common in many drug stores today.

The tinctures proposed, excepting two, viz.: cactus grandiflorus and saw-palmetto and santal, should be included.

We find conflicting reports regarding the efficacy of tincture of cactus grandiflorus and think elixir saw-palmetto and santal would be a more useful preparation than the tincture.

The spray solutions are good combinations, if they would be used, but we notice most physicians employ their own formulas when prescribing sprays.

Salicylated mixture of iron, and compound gargle of guaiac, may have a local use somewhere, but they do not appeal to us as being of sufficient importance to justify their inclusion.

The borax honeys we pass without comment other than to say that our grandmothers had many such remedies.

The fluidextracts should be included. We made but one of this class, that of baptisia; it is a very satisfactory preparation.

The fluidglycerates should be increased in number. We made samples of all of the ones proposed, and they are satisfactory except that of cascara, which has a slight precipitate. Fluidglycerate of licorice we have had for three years and consider it the best form of licorice in fluid state; its uses may be many and the taste is much like that of ammoniated glycyrrhizin.

We predict that the fluidglycerates will become popular, excepting perhaps krameria, which is little used in the middle west.

Liquid petroxolin is an improvement on the one of the present formulary. The iodine petroxolin separated for us after two weeks standing.

We did not make the granulated effervescent salts, but they seem to be somewhat out of line with those in common demand.

It is a disappointment that the majority of the proposed formulæ are not such

preparations as those in demand by the medical profession in this section of the country.

If a manufacturing pharmacist should confine his manufacture to the preparations now official, including the formulas proposed, he would have to close his business as soon as his cash on hand was exhausted.

LABORATORY OF THE MCPIKE DRUG CO., Kansas City, Mo.

SOME COMMENTS ON THE PROPOSED FLUIDGLYCERATES OF THE N. F.

ERNEST R. SMITH.

The fluidglycerates, as proposed by the committee on National Formulary constitute a class of preparations in which each cc. contains the active constituents in 1 gm. of drug. They are intended to be of the same strength as the fluidextracts.

The menstuum contains 50 percent by volume of glycerin and no alcohol. This class of preparations, consisting of about 86, was first experimented on by Geo. M. Beringer. Five of them are now suggested for inclusion in the forthcoming National Formulary.

The writer made and tested the different preparations as suggested in the "Journal of the A. Ph. A., Vol. 1, No. 3," using 125 gm. of drug for 125 cc. of the finished product.

In each case the drug was ground by hand and passed through a sieve corresponding to the number of powder required.

Fluidglycerate of Glycyrrhiza. A number 20 powder was used and an alkaline menstruum. The writer experienced some difficulty with this preparation. The formula suggests that it be *"packed very lightly."* The drug being in a coarse powder the menstruum has a tendency to run through unevenly when packed as directed, but when packed a little more firmly the writer had no difficulty.

Using the prescribed amount of menstruum there was not enough to saturate the drug and leave a stratum above, and the chloroform water was used to make up the deficiency.

The finished product is a first class preparation and the taste is superior to the fluidextract. The peculiar sweetening properties of glycerin seem to do away with the slight acrid taste which the fluidextract has.

It is of interest to note that in a preparation made 2 years ago, only a slight precipitate has formed, hence the keeping qualities are good.

Fluidglycerate of Krameriæ. No difficulty was experienced with this preparation and the finished product has every appearance of a good preparation.

Fluidglycerate of Cascara Sagrada. The writer met with the same difficulty as in the fluidglycerate of licorice, viz.: the amount of menstruum was not sufficient to saturate the drug and leave a stratum above.

The finished product seems to be of good quality, and the drug is entirely exhausted of its desirable constituents.

Fluidglycerate of Cascara Sagrada Aromatic. In this preparation there was insufficient amount of menstruum to saturate and leave a stratum above.

The finished product is an excellent preparation and the bitterness which Cascara possesses is entirely disguised.

Fluidglycerate of Rhubarb. The finished product is a thick, clear, brownish black liquid, free from sediment, and has the appearance of an excellent preparation.

The marc contained none of the active constituents of the drug, which shows that the drug was entirely exhausted.

In conclusion, it is the writer's opinion that the fluidglycerates, as a class, possess many advantages over the fluidextracts. They do away with alcohol which is expensive, and in some states, hard to obtain. Their keeping qualities are excellent. Also, alcohol is frequently therapeutically contraindicated, and these preparations give the physician a concentrated infusion.

It remains to be determined, whether the glycerol-water menstruum and chloroform water, dissolves any of the undesirable constituents from the drug.

LABORATORY OF THE MCPIKE DRUG CO., Kansas City, Mo.

THE EDUCATION OF THE PUBLIC.

The education of the public in matters pharmaceutical is being attempted in various (American) states, with the object of putting the druggist right in the eyes of the public. During the past decade certain lay newspapers have carried on campaigns against the proprietary medicine business, with the admitted object of destroying it. Recently there appeared in the "Ladies' Home Journal" an article entitled, "The Meanest Business in the World—Cheating the Sick," wherein remedies for women's ailments, soothing syrups, and headache and cough preparations were condemned as a class. .Unfortunately, the writer made his attack too inclusive, stating that such medicines (excluding the first named) "all depend for their effect upon alcohol, and one or all of the stupefying drugs—opium, morphine, or chloroform." The writer went on to say that, "used to excess, they kill outright; used even in moderation, they gradually become a necessity to the child's system, and before the parents realize the danger they have on their hands a victim of the drug-habit." Such misstatements are freely copied by the newspapers throughout the country, with the result that an unmerited slur is cast upon the drug business. In order to combat this influence, the Wisconsin State Pharmaceutical Association has formed a publicity bureau, charged with the duty of disseminating among the country papers short articles that will set the druggist right in the public eye. The time has come when the public must be told that the maker of ready-made medicines is not necessarily a faker and charlatan.—*The Chemist and Druggist* (London).

Section on Education and Legislation

Papers Presented at the Sixty-First Annual Convention

THE LETTER OF THE LAW.

CHARLES H. LAWALL.

"There are nine and sixty ways of constructing tribal lays,
And every single one of them is right."

To one who has had practical experience in legal cases and has observed criminal court procedure from the standpoint of an impartial witness, the most noteworthy feature is the unvarying adherence to forms and customs which magnify the letter of the law, frequently to such an extent that the spirit of the law is either entirely lost to view or is so obscured by the mass of technicalities as to be practically unrecognizable as a factor in arriving at a verdict.

When an experienced criminal lawyer and brilliant district attorney are on opposite sides in a case presided over by an able judge, a feeling of bewilderment is experienced by the spectator who sees the real issue disappearing in the mists of legal controversy which arise over points non-essential to that real issue.

It is like some gigantic game which must be played strictly according to the rules and in which the stake is often human liberty or even life, where the jury and many of the participants and spectators, having very little knowledge of the "rules of the game," sit through the trial with but slight appreciation of the finer points that are argued and decided in the preliminary skirmishing which always characterizes a hard fought case. To the credit of our jury system be it said that, if the case actually reaches the jury for decision and no binding instructions have been given them by the judge who presides in the case, the jury is usually able to separate the wheat from the chaff and to decide the case strictly upon its merits.

The prosecution of food and drug adulteration cases is usually along simple, well defined lines, technical, literal or trivial though they may be. The defense, however, is hampered by no restrictions as to consistency and cases are sometimes tried in which the defense reminds one of the story, hypothetical, of course, of the man who was arrested for breaking a neighbor's axe which he had borrowed. His defense was along three lines: First, that the axe was sound when he returned it; second, that the axe was broken when he borrowed it; and third, that he had never borrowed the axe.

What must be the feelings of a layman in examples like one recently offered in an Eastern city, where a municipal ordinance was being enforced in prohibiting food adulteration, when a judge of one of the courts acted as attorney for the defense and attacked and overthrew the ordinance upon the purely technical

grounds that it had not been read and published the number of times required by law and that some of its penalties differed slightly from those prescribed by another municipal ordinance which had not been repealed and which, on account of its priority, took precedence over the later one in some particulars. No question as to the guilt or innocence of his clients was involved in this defense, that being made as an entirely separate and distinct effort, with the final outcome that his clients were found guilty but that the ordinance had been illegally passed and was therefore non-effective.

The prosecution of cases for technical breaches of laws where the spirit of the law has not been violated, have been frequently reported in pharmaceutical news columns. Take for example the celebrated tincture of nux vomica case in New Jersey many years ago, where adherence to the requirement then official in the U. S. Pharmacopœia, of a certain amount of extractive matter in the finished prepartion resulted in the penalizing of a pharmacist whose preparation differed in this non-essential particular, although it was clearly proved that the alkaloidal strength (which is now the standard) was fully up to the requirements for a full strength preparation.

Another instance is found in the prosecutions brought for violation of the requirements in distilled water which was supposed, under the U. S. P. 1890 to leave no residue upon evaporation. It has since been proved that distilled water takes up small amounts of soluble matter from the glass containers in which it is kept, and this point is now covered by a more liberal provision of the standards in the matter of the residue, while retaining tests sufficiently rigid to exclude the use of raw water as a substitute, thus preserving the spirit of the requirements.

Few laws are fool proof in the hands of a commissioner or other official who wishes to multiply cases regardless of their actual merits. No pharmacist, however conscientious and careful he may be, is safe unless he has a knowledge of laws and requirements impossible to expect in one who has so many other and more important matters affecting the public health to occupy his attention. How many pharmacists know that only the "unpeeled" calamus is recognized in the Pharmacopœia or would hesitate to sell to the casual purchaser, who said that he wanted some calamus to make his own "bitters," the peeled rhizome usually found in the stores; and yet such a seller would be guilty of a technical violation of the law and could be legally prosecuted under any of the state food and drug acts which are in conformity with the national law. This may be dangerous information to place in the hands of some officials charged with the enforcement of these acts, but it illustrates the manner in which the letter of the law may be enforced irrespective of its spirit.

One instance which has occurred within the writer's experience, illustrating a ridiculously literal interpretation of the law, with just about as much justice in it as there would be in a calamus case, was of a drug commissioner who prosecuted a firm of wholesale druggists because their tincture of opium showed but 46 percent of alcohol, a difference of only several percent from the amount found in a tincture made by the official process under the most favorable conditions, and which might easily be accounted for by variation in the extractive matter present in the opium or slight loss during the final filtration. The alcoholic strength is made no part of the requirements of the tincture and is only inferential. It was

shown by the defendants and admitted by the Commissioner that the morphine strength of the laudanum was fully up to the standard, but much time, trouble and money was expended in defending a case which had absolutely no merit whatever from the standpoint of justice or of protection to the public.

The same kind of blind, unreasoning interpretation of laws and rulings was recently indulged in by an official in the Bureau of Animal Industry, who, in his over zealous efforts to enforce the new rulings regarding the declaration of cereal starches in sausage, discovered that coriander as commercially found upon the market, contained a few vetch seeds which were necessarily ground with the coriander and, notwithstanding the efforts of a dealer in spices to clean the seeds as far as was possible by mechanical means, ruled that "if the coriander seed contained only one vetch seed in a million it would necessitate the labeling of sausage in which a fraction of a percent of such coriander were used as seasoning, as containing leguminous starch." This may sound ridiculous, but it is a fact, and the spice dealer was forced to appeal to the Secretary of Agriculture to bring about a common sense interpretation of the ruling in question.

A case is also upon record where one of the Government departments turned down a sample of cresol (which is well known to be a varying mixture of three isomeric compounds) because it differed a decimal figure in the third or fourth place in its specific gravity from the official pharmacopœial requirements, although it was shown that the antiseptic and germicidal value was as high or even slightly higher than the average of samples conforming absolutely to the specific gravity of the Pharmacopœia.

It required a legal interpretation of the Federal Food and Drugs Act by the courts to decide that the silver coating on dragees or cachous is not a violation of that section of the Act which prohibits the use of mineral substances in confectionery and there is yet opportunity on the part of fanatic officials to prosecute candy manufacturers for the use of salt or cream of tartar, both of which are undoubtedly mineral substances within the literal meaning of the Act and both of which have a legitimate use in making certain kinds of candies. There is really no limit to the possibilities which may yet confront us in the matter of freak rulings and ridiculously technical prosecutions.

The injustice is not always on the part of the officials, however. Many manufacturers juggle words and phrases on their labels in a manner which reminds one of the episode in "Alice in Wonderland," where Alice and the Red Queen are conversing and the Red Queen offers Alice a position in which one of the inducements in the matter of wages is "jam every other day." Alice declines the offer saying that she does not care for any jam, whereupon the Red Queen's answers to the effect that it is just as well for "jam every other day means jam yesterday or jam tomorrow but never jam today."

The recently published cases of alleged adulteration of broken senna and of ground colocynth are examples of the lengths to which dealers will go in attempting to win a technical victory irrespective of the spirit of the law. The use of synonyms, such as "bitter apple" for colocynth, which constituted the defense in the case referred to, always leads, if not to ambiguity, at least to a basis for argument.

Synonyms are frequently used with about as much consideration and fore-

thought and with as much definiteness as in the following case which happened a number of years ago in my presence, and which is a fine example of their unreliability.

A party of men on a vacation trip in Pike County, Pa., where there are many French settlers, were sitting on the porch of the inn where they were stopping, when one of the typical French farmers came up the road carrying a large size vegetable which belonged unmistakably to the Cucurbitaceæ or gourd family. An argument immediately arose as to whether the specimen was a squash or a pumpkin and without any idea as to the ability of the peasant to decide such a momentous (?) question, a small bet was made by two members of the party and it was decided to leave it to the Frenchman. "What is the name of that vegetable?" asked the interlocutor, an unbiased member of the party. "It is ze squash," replied the peasant. Quick as a flash the man who had the losing side of the bet asked, "What is it used for?" Equally prompt was the reply on the part of the peasant, "To make ze punkin pie." Tableau! All bets declared off.

There is no doubt whatever that now, since the grosser forms of adulteration have been largely eliminated by the combined effect of a rigorous enforcement of the laws and the awakened consciences of the majority of manufacturers, the pendulum will swing even further than it yet has in the direction of basing prosecutions upon non-essential technical points, before we return to safe and sane conditions.

What we need to bring about a healthy condition in food and drug legislation is not large numbers of prosecutions based upon trivial or non-essential points, in which nominal fines (that act in no way as a deterrent) are imposed, but fewer and more wisely selected cases which involve basic principles where a penalty is imposed that really makes the defendant feel the weight of the punishment, and then to follow up these prosecutions by a continued enforcement of the law in similar cases until such violation is entirely stamped out. Concentration of effort, wisely directed, was never more needed than at present in matters pertaining to food and drug adulteration, for a continuation of some of the abuses of the past will bring about a chaotic condition in which the old laws will be discredited and no new legislation can be enacted.

Every honest manufacturer, and the large majority of them are honest, will welcome and uphold the enforcement of laws according to their spirit, but much of the opposition to food and drug legislation of any kind has been stimulated by the injustice which has often been done by the magnification of harmless technicalities into crimes of the first or second magnitude.

This change in the methods of conducting prosecutions must be accompanied by an equally sincere change on the part of some manufacturers who exert their efforts, not in seeing how good a product can be turned out, but how close they can come to violating the law without actually rendering themselves liable. When these two classes of reform have been brought about and when the letter of the law has ceased to be magnified out of all proportion to the spirit of the law, then and not until then, will we be considered as having really progressed.

STANDARDIZING A THREE YEAR COURSE.

HENRY L. TAYLOR, PH. D.

The Point of View Looks Forward: The December, 1912, Pharmaceutical Era contained an article in which National Standards in the schools of Pharmacy of the United States were discussed.

That analysis looked to the future rather than to the past, and the time seems opportune for discussing it.

As evidence that this conclusion is justified and to further establish the point of view let me quote from the proceedings of two pharmaceutical associations that met in Denver, August, 1912.

National Association, Boards of Pharmacy: "Your committee (Legislative) would, therefore, recommend that a National Committee on examinations be named by this Association, whose duty it shall be to provide the questions and direct the method of examination of all candidates desiring a National Reciprocal Certificate, and also rate the papers after the examination. The qualifications exacted of a candidate for a National certificate should be, not less than four years of practical experience, high school education, or its equivalent. Graduation from a school of pharmacy complying with all the requirements of the National Syllabus Committee.

"The adoption of this plan need not interfere with the Reciprocal Registration now in effect between the various states, nor in any sense does it serve to take the place of such registration, but it provides a plan whereby all states regardless of the law requirements may give an opportunity to a pharmacist who deserves it, a certificate of registration that will be evidence of his qualification to practice in any state and be recognized without being required to take another examination.

The American Conference of Pharmaceutical Faculties:

"There is a large and growing field for the preparation of municipal, state and federal inspectors, analysts and other administrators of food, and drug laws; of private analysts and others engaged in the higher lines of professional pharmaceutical work; of instructors and professors in pharmacy schools; of members of boards of pharmacy, who shall be really qualified for the performance of their high and difficult duties; of men qualified to take charge of manufacturing establishments or departments thereof. It is believed that the splendid facilities possessed by many of our pharmacy schools should be utilized in preparing such workers and that the practical instruction given in our better pharmacy schools is fully equal to that given in any of the scientific departments of the universities. If such an extension and elevation of the work of the pharmacy schools can be accomplished without in any way disturbing the conditions in the separate department, which is devoted to preparing students to become practicing pharmacists, this is a consummation devoutly to be wished, and one that cannot fail to reflect credit upon this conference for all time to come, and to place professional pharmacy on a far higher plane of reputation than it has ever before enjoyed."

From these quotations it is apparent that the next step upward in pharma-

ceutical education *is being taken,* and that the three-year course in process of standardization. It is my present purpose to attempt to show how this course lends itself to the proposed national license valid for the United States. The placing of the two quotations in juxtaposition seems well nigh sufficient. But there are details of the national license that must be worked out. Let us consider a tentative plan, and that you may follow it more intelligently, it is before you in type:

The Requirements for the National License.

The life license valid for the United States shall be issued by the American Pharmaceutical Association.*

The examinations on which it is issued shall be conducted by the National Association of Boards of Pharmacy through the State Board signators to the agreement.

Satisfactory evidence verified by oath shall be required by the National Association of Boards of Pharmacy of all candidates for admission to the examinations. It shall admit to the examinations for the national license any candidate that pays a fee of $25 and

1 Is more than twenty-three years of age;
2 Is of good moral character;
3 Had prior to beginning the first year of study in the school of pharmacy,
   (a) At least the equivalent of one year's apprenticeship under pharmacists registered by the state board,
   (b) A general preliminary education equivalent to the successful completion of a four years' course in a secondary school recognized by the state educational authorities;
4 Has studied pharmacology as outlined in the Pharmaceutical syllabus *not less than three years* in a registered or accredited school of pharmacy;
5 Has received the diploma of pharmaceutical chemist (Ph. C) from a school the member of, or affiliated with the American Conference of Pharmaceutical Faculties;
6 Has had two years successful experience as a licensed pharmacist, one year of which must have been in a pharmacy of the United States.

The Standard Three Years Course: The discussion of the requirements for the three years course may emphasize as many points as there are requirements, including such questions as the general preliminary education for admission to the school; the professional subjects and the time devoted to them; the general culture subjects and their relative values.

It is not my purpose (and some may think it not my province) to discuss the professional side of the subject. What subjects should comprise the course and what proportion of time be given each is now being worked out in the best of laboratories—the stronger schools of the country. Moreover other organizations are discussing its underlying principles, outlining and perfecting their details. Their conclusions will be reported in due time.

The emphasis will be thrown on the general preliminary education in the following: "You can do a great deal in pharmaceutical education by emphasizing the absolute necessity of more preliminary education before the study is undertaken. The trouble is that matriculates of one year high school education cannot grasp the intricacies of pharmaceutical education.

*(The recognition of such a license would be wholly optional with the various states.—EDITOR.)

It is deplorable that otherwise intelligent men cannot see the folly of their activity—the standardization of a degree that will make us appear ridiculous in the eyes of intelligent people."

Absolute Necessity of More Preliminary Education: How shall this necessity be emphasized? How many of you this year looked into the faces of the graduating class of your local grammar school? Note that I said grammar school, *not* high school; the latter experience is more common and the exercises more formal.

You saw, did you not? Children on the average less than fifteen years old. *American* children, not European, Asiatic, African, or Australian. Children just entering the period of adolescence. One year later you will miss from that class how many that have died physically? how many that have died intellectually? how many that have lagged behind from unavoidable reasons,—sickness or removal of person or family? But there has been a survival,—*wonderful* when one thinks of the perils of the period; *pitiable*, when one views the wreckage.

After ten years campaign you have persuaded yourselves that it is reasonable to require that your profession be recruited from the ranks of the survivors. *What is* the physical condition of these survivors of the first year of high school life? They are our boys of sixteen and our girls of fifteen on the average, who have just entered on that marvelous period of life—the period of adolescence.

Their intellectual capacity is being measured by what tests? Fair ability to read, write and think the ideas of simple arithmetic through proportion, English of Cooper and Longfellow; the Elements of Algebra, of History, of Latin, of Drawing, and of Biology.

And what is their moral fiber? The sixteen year old powers of children attracted by the movies; listening to the growls against graft; interested in the national game and tempted by the glitter of gain at the expense of others, at the expense of principles, at the expense of self.

After years of study your experts are in practical agreement that your recruits from the survivors should, during the next five years, acquire a practical experience of at least from one to five years. But you are not agreed as to what that experience shall be. You are not clear in your definition of apprenticeship. Some of you say that the recruit washing glasses at a soda fountain becomes thereby learned—*doctus*, a doctor; while others affirm that a recruit older and wiser by those additional years of high school instruction working under the skilled instruction of a teacher in the dispensary department of a university course does not acquire the requisite skill.

What are you advising your recruits from the survivors of the first high school year to do with the half decade of their life between the date of their survival of your preliminary tests,—the promotion examinations to the second high school year,—and their final tests—the examinations of your State Boards? Are you requiring them to pack themselves full of the educational opportunities you and others furnish so lavishly by public and private munificence in high schools and schools of pharmacy from Maine to California, and from Minnesota to Texas. Or, the rather, are you letting them waste the five years, acquiring little intellectual power and less moral fiber?

How are you helping parents in the critical period of the family's life—the period of adolescence? Are you going out into the highways and hedges and

compelling them to come into the feast spread for them in schools and colleges, to enjoy at the feast the society of the great of all ages?

A generation ago the thought of a compulsory school law was intolerable to the American voter. Today the compulsory school law is common throughout the United States for the elementary school. Is not the prerequisite clause in the professional laws in effect a compulsory law for secondary schools?

Does not the duty lie with your profession to help in securing to the parents, to the teachers, to the school officials the help of a prerequisite law, for admission to the practice of pharmacy in its simplest forms?

And is not the corollary equally clear? That the higher forms of license make more preliminary education "absolutely necessary?"

The Prerequisite Clause: Let us in closing throw the emphasis on the necessity for an aggressive campaign to secure this beneficent regulation in all states not now passing it. Such campaign properly lies with the N. A. B. Ph. and the A. Ph. A. The joint sessions of these bodies afford the opportunities for outlining and directing the propaganda. Only a definite plan is necessary to inaugurate the movement.

PHARMACY LAWS PROPOSED, ENACTED OR AMENDED DURING 1912-1913.*

FRANK H. FREERICKS.

(Concluded from February Issue.)

MISCELLANEOUS PHARMACY LAWS PROPOSED OR ENACTED.

ANTI-TRUST AND UNFAIR COMPETITION LAWS OF NEW JERSEY OF 1913.

1. It shall be unlawful for any person, firm, corporation or association, engaged in the production, manufacture, distribution or sale of any commodity of general use, or rendering any service to the public, to discriminate between different persons, firms, associations or corporations, or different sections, communities or cities of the state, by selling such commodity or rendering such service at a lower rate in one section, community or city than another, or at a different rate or price at a point away from that of production or manufacture as at the place of production or manufacture, after making due allowance for the difference, if any, in the grade, quality or quantity, and in the actual cost of transportation from the point of production or manufacture, if the effect or intent thereof is to establish or maintain a virtual monopoly, hindering competition, or restriction of trade.

*Continuation of the report of the secretary of the Section on Education and Legislation. See Journal for January, p. 67, and February, p. 196.

2. Any person or corporation violating this act shall be guilty of a misdemeanor and on conviction thereof shall be punished accordingly.

3. This act shall take effect immediately.

Approved February 19, 1913.

1. It shall be unlawful for any merchant, firm or corporation, for the purpose of attracting trade for other goods, to appropriate for his or their own ends a name, brand, trade-mark, reputation or good will of any maker in whose product said merchant, firm or corporation deals, or to discriminate against the same, by depreciating the value of such products in the public mind, or by misrepresentation as to value or quality, or by price inducement, or by unfair discrimination between buyers, or in any other manner whatsoever, except in cases where said goods do not carry any notice prohibiting such practice, and excepting in case of a receiver's sale, or a sale by a concern going out of business.

2. Any person, firm or corporation violating this act shall be liable at the suit of the maker of such branded or trade-marked goods, or any other injured person, to an injunction against such practices, and shall be liable in such suit for all damages directly or indirectly caused to the maker by such practices, which said damages may be increased threefold, in the discretion of the court.

3. This act shall take effect immediately.

Approved April 1, 1913.

THE DEFEATED ITINERANT VENDOR'S BILL OF OHIO.

Be it enacted by the General Assembly of the State of Ohio:

Section 1. Any person, firm or corporation desiring to engage either as principal or as agent, in the business of selling, or vending by peddling, or by canvassing from house to house, or by vending from valise, pack, bundle, wagon or other vehicle, or by public out-cry, or upon the street or public highway, any drug or medicine, or any combination or mixture of drugs and medicines recommended for the cure, treatment or mitigation of disease, injury, or deformity, either of men or other animals, shall apply to the state dairy and food commissioner for a license, or for a certified copy thereof as provided in section two of this act, authorizing such peddling, canvassing, selling or vending.

Every application shall be in the form prescribed by the state dairy and food commissioner, and shall particularly set forth the drugs, medicines, or combinations or mixtures thereof desired to be vended or sold, and shall be accompanied by samples of such drugs, medicines, combinations or mixtures, and if a compound or mixture, by a true statement of the composition thereof, and by copies of the circulars, labels or other printed matter by which such articles are to be accompanied or advertised.

If the state dairy and food commissioner is satisfied that such application is in the proper form and that the drugs, medicines, combinations or mixtures proposed to be sold or vended do not contain poisonous or habit-forming drugs in greater proportion than is permitted by law, or alcohol in greater proportion than is necessary to preserve or hold the essential ingredients of such drugs, medicines, combinations or mixtures in solution, and that such preparations cannot be used as alcoholic beverages nor to create or satisfy a drug habit, and that they are not dangerous to life or health, nor intended for unlawful or immoral

purposes, he shall upon receipt of the fees hereinafter described, cause to be issued to such applicant a license authorizing the selling, peddling or vending of such drugs, medicines, combinations or mixtures thereof.

Such license shall particularly describe the drug, medicine, combination or mixture authorized to be sold thereunder, the name of the person, firm or corporation to which the license is issued, the date when such license expires, and shall be signed by the state dairy and food commissioner.

It shall be unlawful for the state dairy and food commissioner or for any inspector of any employe of the state dairy and food department to disclose any information concerning the composition of any drug, medicine, compound or mixture which is set forth in any application for license under this act, except in legal proceedings instituted for the enforcement of this act or of other provisions of law. Nothing in this or in any other section of this act shall be construed to affect the operation of any provision of law regulating the practice of pharmacy, medicine, dentistry, or veterinary medicine, or regulating the sale of alcoholic liquors, habit-forming drugs, or of food and drugs, nor shall it be construed to suspend or avoid the operation of any legal ordinance of any municipality regulating the itinerant vending or peddling of drugs, medicines or other articles.

Section 2. The state dairy and food commissioner shall be authorized to charge and collect the sum of ten dollars ($10.00) for each such license, and if the sale of more than one drug, medicine, compound or mixture is authorized thereunder, he shall be authorized to charge and collect the sum of one dollar ($1.00) for each such additional drug, medicine, compound or mixture. No person, firm or corporation shall be required to procure more than one license for the sale of any preparation, but each agent shall be required to carry with him the license obtained by his principal, or a certified copy thereof, and to produce the same for inspection when requested to do so by any officer of the law, or by any inspector of the state dairy and food department, and when more than one agent or canvasser is employed by any person, firm or corporation, the state dairy and food commisioner shall furnish certified copies of such license for each of such agents or canvassers and shall charge the sum of two dollars ($2.00) for each copy thereof. No license shall be issued for a longer period than one year.

The state dairy and food commissioner shall cause a record to be kept of such licenses issued under this act, to whom issued and of the dates of expirations thereof, which licenses shall be consecutively numbered, and all drugs, medicines, combinations or mixtures thereof, authorized to be sold or vended thereunder shall bear a label upon which is printed in plain and easily read letters the words, "Sale authorized by Ohio license No. ———" accompanied by the serial number of such license and the date when such license will expire.

Section 3. Any person, firm or corporation, who, either as principal or agent, shall sell or offer for sale, by peddling, or by canvassing from house to house, or by vending from valise, pack, bundle, wagon or other vehicle, or by public out-cry, or upon the street or public highway, any drug or medicine, or any combination or mixture of drugs and medicines recommended for the cure, treat-

ment or mitigation of any diseases, injury or deformity, either of man or other animals, without first having obtained a license from the state dairy and food commissioner as hereinbefore provided, or any one who shall state falsely the composition of any drug, medicine, combination or mixture in any application for license under this act, shall be deemed guilty of a misdemeanor, and upon conviction shall be fined not less than fifty dollars ($50.00) nor more than two hundred dollars ($200.00) for the first offense, and on any subsequent conviction for the same offense shall be fined not less than two hundred dollars ($200.00) nor more than five hundred dollars ($500.00).

All license and other fees and all fines collected under this act shall be paid to the state dairy and food commissioner, and by him shall be paid into the state treasury, where they shall be disposed of according to law.

Section 4. It shall be the duty of the state dairy and food commissioner to administer the provisions of this act, to investigate charges of violation of any of the said provisions, to prosecute or cause to be prosecuted any person, firm or corporation guilty of such violation and to make such proper and lawful rules and regulations as may be necessary to carry the provisions of this act into effect.

NEW YORK WEIGHTS AND MEASURE LAW.

Section 1. Chapter twenty-five of the laws of nineteen hundred and nine, entitled "An act relating to general business, constituting chapter twenty of the consolidated laws," is hereby amended by adding thereto, at the end of article two, eight new sections, to be sections sixteen, sixteen-a, seventeen, seventeen-a, seventeen-b, seventeen-c, eighteen, and eighteen-a, respectively, as follows

Section 16. Method of sale of certain commodities. All meat, meat products and butter, shall be sold or offered for sale by weight. All other commodities not in containers shall be sold or offered for sale by standard weight, standard measure or numerical count, and such weight, measure or count shall be marked on a label or a tag attached thereto; provided, however, that vegetables may be sold by the head or bunch.

Section 16-a. Certain sizes of containers when used for vegetables, produce and fruit prescribed. No person shall manufacture, sell, offer or expose for sale containers for vegetables, produce or fruit that are not of the capacity of one barrel, half-barrel, one bushel, or multiples of the barrel, or sub-multiples of the bushel divisible by two; provided, however, that fruits, vegetables and produce may be sold in other sized containers if the net capacity in terms of standard dry measure is plainly and conspicuously marked, branded or otherwise indicated in the English language on the outside or top thereof, or is marked in accordance with the provision of section seventeen. A barrel within the meaning of this and the ensuing sections of this article shall represent a quantity equal to seventy hundred and fifty-six cubic inches or conform to the following dimensions. Head diameter, seventeen and one-eighth inches; length of stave, twenty-eight and one-half inches; bilge not less than sixty-four inches outside measurement; distance between heads not less than twenty-six inches; and to be known as a standard barrel. A reasonable variation of the capacity specified shall be allowed.

Section 17. Net contents of containers to be indicated on the outside thereof. When commodities are sold or offered for sale in containers of other sizes than

those specified in section sixteen-a or whose sizes are not otherwise provided by statute, the net quantity of the contents of each container, or a statement that the specified weight includes the container, the weight of which shall be marked, shall be plainly and conspicuously marked, branded or otherwise indicated on the outside or top thereof or on a label or a tag attached thereto in terms of weight, measure or numerical count; provided, however, that reasonable variations shall be permitted.

Section 17-a. When sections sixteen, sixteen-a and seventeen shall not apply. Sections sixteen, sixteen-a and seventeen shall not apply to containers or commodities in containers with ornamentations or decorations exclusively for gifts or social favors, or to commodities dispensed for consumption on the premises, or to commodities or containers put in receptacles used merely for the purpose of carrying or delivering of commodities or containers complying with the provisions of such sections, or when the numerical count of the individual units is six or less, or in the case of liquids when the contents is two fluid ounces or less, or when the weight of the contents is three avoirdupois ounces or less, or to commodities packed, put up or filled prior to eight months after this section takes effect or to bottles used for the purpose of the bottling of spirituous, maltous, vinous, or carbonated beverages until eight months after this section takes effect.

Section 17-b. Guaranty furnished by wholesaler, jobber or manufacturer. No person shall be prosecuted under the provisions of this article, following section fifteen thereof, when he can show guaranty signed by a wholesaler, jobber or manufacturer, residing in the State of New York from whom he purchased the commodity in containers to the effect that they were not incorrectly marked within the meaning of such sections of this article. The person making the sale and guaranty shall then be amenable to the prosecution, fines, and other penalties, which would in due course attach to the dealer under the provisons of such sections. The name appearing on the container and the marking as provided by section seventeen shall be deemed to constitute a guaranty.

Section 17-c. Definition of terms "container" and "person." "A container" as used in this article, following section fifteen thereof, shall include any carton, box, crate, barrel, half-barrel, hamper, keg, drum, jug, jar, crock, bottle, bag, basket, pail, can, wrapper, parcel or package. "A person" as used in such sections shall be considered to import both the singular and the plural and shall include corporations, companies, societies and associations, and whether acting through an agent or servant.

Section 18. Examination and prosecution. The examination of the weight, measure or numerical count of the contents of containers as provided by section seventeen shall be made by the State superintendent of weights and measures or under his supervision or direction by any of the weights and measures officials of the State; except that in the city of New York such examination shall be made by the commissioner of the mayor's bureau of weights and measures of the city of New York. When after such examination there is cause to believe that a provision of section seventeen has been intentionally violated the State superintendent of weights and measures shall, after notifying in writing the person so accused of such accusation, certify the results to the attorney-general with a copy

of the results of the examination duly authenticated under oath by the official making examination. The attorney-general shall cause appropriate proceedings in the name of the people of the State of New York to be commenced and prosecuted in the proper courts of the State without delay for the enforcement of the penalties therefor; except that in the city of New York the commissioner of the mayor's bureau of weights and measures shall in cases where he acts, after notifying in writing the person so accused of such accusation certify the result to the attorney-general, with a copy of the result of the examination duly authenticated under oath by the official making such accusation. Such attorney-general shall cause appropriate proceedings in the name of the people of the State of New York to be commenced and prosecuted in the courts of the State of New York without delay for the enforcement of the penalties therefor. The State superintendent of weights and measures with the co-operation of the chief or principal weights and measures officials of the cities of the first class shall establish uniform tolerances or amounts of reasonable variation and shall make uniform rules and regulations for carrying out the provisions of sections sixteen, sixteen-a, seventeen, seventeen-a and seventeen-b.

Section 18-a. Penalties. A person violating any of the provisions of sections sixteen, sixteen-a, seventeen, seventeen-b, shall be punished by a fine of not less than twenty-five dollars nor more than one hundred dollars for the first and second violations, and by a fine of not less than one hundred dollars nor more than five hundred dollars for subsequent violations.

Section 2. Section nine of such chapter and section two hundred and sixty-three of chapter nine of the laws of nineteen hundred and nine, entitled "An act in relation to agriculture, constituting chapter one of the consolidated laws," are hereby repealed.

Section 3. This act shall take effect June first, nineteen hundred and thirteen.

THE WEST VIRGINIA PROHIBITION LAW EXEMPTION WITH REFERENCE TO PHARMACY.

Section 4. The provisions of this act shall not be construed to prevent any one from manufacturing for his own domestic consumption wine or cider; or to prevent the manufacture from fruit grown exclusively within this state of vinegar and non-intoxicating cider for use or sale; or to prevent the manufacture and sale at wholesale to druggists only of pure grain alcohol for medicinal, pharmaceutical, scientific and mechanical purposes, or wine for sacramental purposes by religious bodies; or to prevent the sale and keeping and storing for sale by druggists of pure grain alcohol for mechanical, pharmaceutical, medicinal and scientific purposes, or of wine for sacramental purposes, by religious bodies, or any United States Pharmacopœia or National Formulary preparation in conformity with the West Virginia pharmacy law, or any preparation which is exempted by the provisions of the national pure food law, and the sale of which does not require the payment of a United States liquor dealer's tax. But no druggist shall sell any such grain alcohol except for medicinal, scientific pharmaceutical and mechanical purposes, or wine for sacramental purposes, except as hereinafter provided, and the same shall not be sold by such druggist for medicinal purposes,

except upon a written prescription of a physician of good standing in his profession and not of intemperate habits, or addicted to the use of any narcotic drug, prescribing the amount of alcohol, the disease or malady for which it is prescribed, and how it is to be used, the name of the person for whom prescribed, the number of previous prescriptions given by such physician to such person within the year next preceding the date of such prescription, and stating that the same is absolutely necessary for medicine, and not to be used as a beverage, and that such physician, at the time such prescription was given, made a personal examination of such person, and that such person is known to such physician to be of temperate habits and not addicted to the use of any narcotic drug, and only one sale shall be made upon such prescription, and such prescription shall be at all times kept on file by such druggist and open to the inspection of all state, county and municipal officers. It shall be the duty of such druggist to register in a book kept for that purpose all prescriptions from physicians mentioned in this section, stating the name of the party for whom prescribed, the date of the prescription, the name of the physician by whom the prescription is issued, the quantity of such alcohol and the use for which prescribed, and such record shall at all times be open to the same inspection as such prescriptions.

It shall be lawful for a druggist to sell grain alcohol for pharmaceutical, scientific and mechanical purposes, or wine for sacramental purposes by religious bodies, only to any person, not a minor, and who is not of intemperate habits, or addicted to the use of narcotic drugs, who shall, at the time and place of such sale, make an affidavit in writing signed by himself before such druggist, or a registered pharmacist at the time and place in the employ of such druggist, stating the quantity and the time and place and fully for what purpose and by whom such alcohol or wine is to be used; that affiant is not of intemperate habits or addicted to the use of any narcotic drug; and that such alcohol or wine is not to be used as a beverage, or for any purpose other than that stated in such affidavit. Such affidavit shall be filed and preserved by such druggist and be subject to inspection at all times by any state, county or municipal officer, and a record thereof made by such druggist in the record book mentioned in this section, showing the date of the affidavit, by whom made, the quantity of such alcohol or wine, and when, where, for what purpose and by whom to be used. Only one sale shall be made upon such affidavit, and only in the county where the same is made, and no greater quantity than is therein specified. For the purpose of this act, any druggist or registered pharmacist making such sale shall have authority to administer such oath.

If any druggist, owner of a drug store, registered pharmacist, clerk or employe shall upon such prescription or affidavit, or otherwise, knowingly sell or give any such alcohol or wine to any person who is of intemperate habits or addicted to the use of any narcotic drug, or knowingly sell or give the same to any one to be used for any purpose other than that named in said affidavit or prescription, or who shall sell or give away any liquors without such affidavit or prescription, he shall be deemed guilty of a misdemeanor and punished by fine of not less than one hundred nor more than five hundred dollars and confined in the county jail not less than thirty days nor more than six months. In any prose-

cution against a druggist, owner of a drug store, registered pharmacist, clerk or employe, for selling or giving liquor contrary to law, if a sale or gift be proven, it shall be presumed that the same was unlawful in the absence of satisfactory proof to the contrary and the presentation of such prescription or affidavit by the defendant at the time of the trial for such sale or gift, shall be sufficient to rebut the presumption arising from the proof of such sale or gift. Provided, the jury shall believe, from all the evidence in the case, that such sale or gift was made in good faith under the belief that such prescription or affidavit and statements therein were true; and, provided, however, that such druggist, owner of a drug store, registered pharmacist, clerk or employe shall have complied with all other provisions of this act relating to the sale or gift.

An indictment against any druggist, registered pharmacist, clerk or employe, for any offense committed under the provisions of this section, shall be sufficient, if in the form and effect following:

State of West Virginia,

County of....., to-wit:

In the Circuit Court of said County:

The grand jurors in and for the body of said county of..... ....., upon their oaths do present that A. B., within one year next prior to the finding of this indictment, in the said county of..... did unlawfully sell, give, offer, expose, keep and store for sale and gift, liquors, against the peace and dignity of the State.

Section 5. If any person who is of intemperate habits or addicted to the use of any narcotic drug shall make the affidavit mentioned in the preceding section, or if any person making such affidavit shall use as a beverage, or for any purpose, or at any place other than that stated in such affidavit, or shall knowingly permit another to do so, said alcohol or wine, or any part thereof, or shall knowingly make any false statement in such affidavit, he shall be guilty of a misdemeanor and upon conviction be punished by a fine of not less than one hundred nor more than five hundred dollars, and be confined in the county jail not less than two nor more than six months for the first offense hereunder; and for the second offense he shall be deemed guilty of a felony and punished by confinement in the penitentiary not less than one nor more than five years.

And if any physician who is not in good standing in his profession, or who is of intemperate habits, or who is addicted to the use of any narcotic drug, shall issue any such prescription as is mentioned in the last preceding section; or if any physician shall issue such prescription without, at the time, making a personal examination of the person for whom the liquor is prescribed, or shall prescribe for any person who is in the habit of drinking to intoxication and whom he knows, or has reason to believe is in the habit of drinking to intoxication, or shall give such prescription and make the statements therein required, or any part thereof, falsely he shall be deemed guilty of a misdemeanor and upon conviction thereof shall be fined not less than one hundred nor more than five hundred dollars and imprisoned in the county jail not less than thirty days nor more than six months, and in addition thereto, for the first offense under this statute, the court may, in its discretion, suspend the license of such physician for a period of six

months and for each offense thereafter the court shall suspend such license for a period of six months.

THE CIGARETTE LAW OF PENNSYLVANIA.

Section 1. Be it enacted, etc., That any person who shall furnish to any minor, by gift, sale or otherwise, any cigarette or cigarette paper, shall be guilty of a misdemeanor, and upon conviction thereof shall be sentenced to pay a fine of not less than $100.00, nor more than $300.00.

Section 2. Any minor, being in possession of a cigarette or of cigarette paper and being by any police officer, constable, juvenile court officer, truant officer or teacher in any school, asked where and from whom such cigarette or cigarette paper was obtained, who shall refuse to furnish such information, shall be guilty of a misdemeanor; and upon conviction thereof, before any alderman, magistrate or justice of the peace, such minor, being of the age of sixteen years or upwards, shall be sentenced to pay a fine not exceeding $5.00 or to undergo an imprisonment in the jail of the proper county not exceeding five days or both. If such minor shall be under the age of sixteen years, he or she shall be certified by such alderman, magistrate or justice to the juvenile court of the county, for such action as to said court shall seem proper.

Section 3. The act approved May 7, 1889, entitled, "An Act to prohibit the sale of cigarettes to persons under the age of sixteen years and prescribing the punishment for the same" and the act approved April 4, 1903, entitled, "An Act for the protection of the health of persons addicted to the smoking of cigarettes, and imposing a fine for the violation of its provisions" and the Act approved the 16th day of March, 1905, entitled, "An Act for the protection of the health of persons addicted to the smoking of cigarettes and imposing a fine for the violation of its provisions, approved April 4, 1903" and all other acts and parts of acts inconsistent with the provisions of this act, are hereby repealed.

Approved the Ninth day of May, A. D. 1913.

John K. Tener.

The foregoing is true and correct copy of the Act of the General Assembly, No. 137.

Robert McAfee,,
Sec. of the Commonwealth.

THE NEW HONEST ADVERTISING LAW AS PROPOSED AND ENACTED IN MANY STATES.

Be it enacted, etc.:

Any person, firm, corporation or association who, with intent to sell or in any wise dispose of merchandise, securities, service, or anything offered by such person, firm, corporation, or association, directly or indirectly to the public for sale or distribution, or with intent to increase the consumption thereof, or to induce the public in any manner to enter into any obligation relating thereto, or to acquire title thereto, or an interest therein, makes, publishes, disseminates, circulates, or places before the public, or causes, directly or indirectly, to be made, published, disseminated, circulated, or placed before the public, in this state, in a newspaper

or other publication, or in the form of a book, notice, hand-bill, poster, bill, circular, pamphlet, or letter, or in any other way, an advertisement of any sort regarding merchandise, securities, service, or anything so offered to the public, which advertisement contains any assertion, representation or statement of fact which is untrue, deceptive or misleading, shall be guilty of a misdemeanor.

MODERN SHOE POLISHES AND DRESSINGS.

By far the most important and widely used dressing is *"Ladies' dressing,"* so called for its use on women's and children's footwear of kid and goat leathers. It is essentially a colored solution of shellac; borax, or an alkali, being the solvent and nigrosin the color. A little glycerin is usually added to prevent cracking and to preserve the softness of the leather. It is applied with a sponge and leaves, when dry, a soft, pleasing gloss. If soap solution is added to *"Ladies' dressing"* it becomes "Gun-metal dressing." This does not dry bright, but leaves a dull, gun-metal finish. *Patent leather dressing.*—This is usually simply olive or cottonseed oil, or vaseline, or white wax and turpentine. To hide cracks in patent leather, a solution of gun-cotton in amyl acetate, colored with a black spirit-soluble dye. *Nappy dressing,* for ooze, suede, castor, and nappy leathers is wood alcohol tinted with a color insoluble in water. The alcohol cleans the nap, and leaves the color, which, being insoluble in water, does not soil damp garments. *White leather dressings* may be the old-fashioned pipe-clay, or pipe-clay mixed with light magnesium carbonate. The latter gives a better white than pipe-clay alone. Another white dressing is zinc oxide suspended in water with a small quantity of an adhesive. This is applied with a sponge. These white dressings may obviously be tinted with umber, ochre, or other pigments, for canvas shoes of various shades. *Polishes.*—Carnauba wax is the basis of the best modern friction polishes. Candelilla wax may be substituted for the cheaper qualities of polishes. The wax is boiled until emulsified with a solution of borax. The product is known as "white stock." If a paste is required, this "white stock" is mixed with a sufficiency of hot, strong solution of common yellow soap and tinted with nigrosin. A soft paste is thus obtained. If a liquid is required, the best Castile soap is used, as this does not gelatinize on cooling. With moderate friction, the hard waxes held on the leather by the soap give a fine polish. Another method is to melt carnauba or candelilla wax, or a mixture of these, with paraffin wax or beeswax in hot turpentine, and mix with very finely powdered animal black. A firm paste is thus obtained, which easily spreads. When this is poured into boxes, it must be quickly cooled, or separation of the waxes may occur. Beeswax gives a toughness and lack of shortness to the paste, with a smooth finish, which cannot be obtained without it. For *tan leather polish* the basis is the same, but brown or yellow dyes are used instead of nigrosin. *Liquid shoe cleaner* is merely mucilage of tragacanth containing a little oxalic acid in solution.—*J. T. Donald, (J. S. C. I., 1913, 32, 459, through Pharmaceutical Journal.)*

Section on Practical Pharmacy and Dispensing

Papers Presented at the Sixty-First Annual Convention

THE MOST DIFFICULT THINGS TO LEARN IN DISPENSING.

HENRY P. HYNSON, PHAR. D., BALTIMORE.

The acts, the manipulations and the solving of the dispensing problems to which I refer, may be considered difficult to learn, because, comparatively, few learn to do them easily and well, and because actual experience in teaching, plainly and forcefully impresses the fact upon every careful observer. It must not be understood that I have in mind complex problems in higher physics, complicated chemical combinations, the differentiation of allied botanical species or the identification of peculiar plant cells. No, none of these are near so difficult to become familiar with and master as are the every day doings of the modern drug store; such things as the ultra scientific look upon as far beneath their notice.

It may be questioned whether or not all these very ordinary things are difficult to learn or are difficult to teach and there may be other questionings regarding them, for instance, whether their accomplishment is dependent upon natural fitness, adaptability or application; certain it is, that, no matter how secured, one must possess, at least, a moderate amount of *ability to justly estimate the relative value of pharmaceutic doings* before he can learn to meet the requirements just now under consideration; this is intended to mean that unless he regards these common place acts as essential to true success, he will not acquire sufficient knowledge regarding them to meet the actual demands of his vocation.

Touching the subject of special talents or particular fitness, much of interest may be gained from the experiences of teachers of pharmacy. From my own very limited opportunities, I unhesitatingly conclude that so called special talents or natural inclinations are no more or less than results of accidental environment and accidental training. Sensitiveness or, perhaps, vanity has lead me to closely observe students in this regard, and it is a most peculiar fact or, better, a most gratifying fact, that it is invariably the case that students do work in dispensing that is exactly consistent with the work they do in other laboratories and, further, their examinations in the theories of dispensing are almost without exception of the same value as their examinations in the theories of other branches of pharmacy. This is very interestingly shown, in that class of students with which every teacher is familiar: those who impress their instructors favorably and as making excellent progress, but who painfully disappoint when put to a real test. It is believed that these positive observations should finally become helpful, when we decide that a more intelligent segregation of students of all kinds will be the real beginning of better educational methods.

I admit that it may be well to let this discussion pass, for it matters not to us or to many more whether these dispensing accomplishments are difficult to learn or difficult to teach, the fact remains that many of them must be acquired without teaching; also, that few there are in pharmacy today, who have acquired that dexterity and facility in manipulation that to some of us seems an actual essential to worthy success.

It may also be wondered or questioned whether the want or appreciation of the difference, the very great difference between the doing and the *well* doing of things is an infirmity or something that follows a lack of standards. This applies more particularly and with remarkable directness to nearly all very common-place doings; for instance, to walking and talking. Why do so many of us talk badly or, why do we not walk better? These surely are usual and very generally performed acts. Probably, some of us have forgotten, because much of it happened very early in our lives, what great difficulty we experienced and how much pain we suffered in learning to balance ourselves that we might stand upright and move about. Word sounding and word arrangement was not easily acquired and has not yet been fully accomplished. Some of us have never stopped, probably, to ascertain whether our manner of speech is creditable, or not, and there are others who suppose that, to "get along," is all that is required of the walker. Undoubtedly, it is *very, very* difficult either to walk or talk and that is why so comparatively few are highly accomplished in these most becoming essentials. It is quite likely, however, that many are unfortunately unattractive walkers and talkers because there are no sufficiently well-fixed and generally published standards for walking and talking. There are, though, examples of excellence in these with which we may compare our own similar actions and there may be found examples worthy of close study and possible imitation. It is of the "walking" and "talking" in dispensing that I am writing; therefore, all this applies with direct and particular force, to the subject under consideration.

All the difficulties to which I have referred and shall refer, may be easily divided into two classes: those which require mental effort alone, and those which require carefully controlled physical force of greater or less amount, but always properly directed by a mind which has been trained to direct it.

I am uncertain as to the proper sequence of my classes of difficulties. If I knew which was first created, my mind or my body I could better arrange them; after all, these troubles of the dispenser are a confusion of mind and matter and the supremacy is yet, I believe, undetermined. In 1907, I must have thought the body "had the call" for I then presented a paper, at the New York meeting, under the caption, "The Hands and Eyes in Dispensing," (Proceedings, Volume 55, page 124), which is closely related to this discussion and I will be happy if any of my hearers or readers are sufficiently interested to read or re-read that effort, in connection with this later one.

It is decidedly "bromidic" as society folk say, to refer to the general difficulty of applying knowledge, but no matter how common-place this difficulty, it pertains, especially to dispensers, it is fundamental and remarkably prevalent. May not the teachers of the abstract sciences, attached to pharmacy, or the text books be somewhat to blame. The difficulty is not so great in connection with very special subjects, but it is pronounced when general or fundamental teachings are

involved. It may be that we give our dispensing students too much education and not enough training; actual dispensing exercises.

To apply and helpfully use knowledge, then, is difficult to learn. One may have run through the reaction of iron, repeatedly; may have made the solution of its chloride from the metal, oxidized it, diluted the solution with alcohol to make the tincture and then forget that it contains iron, that the iron is in the ferric state, that a chloride is present, that it is strongly alcoholic and decidedly acid. This is not the case with students, only, nor with the graduates of a particular school. Neither does it apply to any one or another class of knowledge, chemistry, physics, drug history, galenical pharmacy, all are very nearly alike in the neglect they suffer. There is a difference, however, in favor of physics and physical characteristics —the more commonplace are, oddly enough, most frequently overlooked. It is very hard for the average dispenser to learn to take advantage of the peculiar physical characteristics of medicinal substances. Many can glibly recite these characteristics, but few can evaluate their helpfulness, or the contrary. Often it is the very slight difference that must be remembered and utilized. The *physical* difference, for instance, betwen an alkaloid and the salt of an alkaloid; chemical differences, are, always, much more apparent. The physical differences of the three great classes of oils,—formidable stumbling block to the thoughtless, but a world of helpfulness to the thinker.

But these more subtle physical differences are not the only ones that are undervalued; the difference in dispensing between a lighter or a heavier substance, between a gummy and a friable drug, between a smooth, caking powder and one that rapidly separates into individual particles, between hard-grinding chemicals and those that are slippery and soft. So many, young and old, with whom I come in contact, still strive and struggle, yet fail to learn, when to properly use light magnesium oxide and when the heavy. Others will never really learn to know why milk sugar is better than powdered talcum for making a dilution of an active alkaloid, or why licorice root is a better absorbent than starch.

You and I may know the solubilities of many drugs, their specific gravity and their volatile or non-volatile tendencies, but how many of us have learned and know the *mechanical* possibilities of different drugs. I would be surprised if some are not quietly asking, "What does he mean by mechanical possibilities, in this connection?" I can assure you if the meaning is not quite clear, then you have not yet learned to advantageously use those possibilities. The dispenser must learn to use medicinal substances, some of them, as veritable tools, with which to do things, with other substances; they are just as much tools as are mill stones, files, planes and scissors; some of them are used for precisely the same purposes, in principle. A fair appreciation of the mechanical abilities of drugs, together with experience, good judgment, and even, a moderate sense of proportion and its value make almost the "IT" of dispensing.

Proportion in dispensing, I fear, is a term almost as new as "mechanical possibilities." It is, of course, a very general term, but want of consideration for it, is the cause of many, very many dispensing shortcomings. Nothing in dispensing technique seems more difficult to acquire than a sense of proportion. To so many, a particular manipulation is always the same, both in extent and force; it is made to fit all quantities and all characters of substances; it is subject to no

modification. Proportion applies to the quantities or to the measurements of things as they exist or as they may be made to exist. Whether a plan, a process, a force or a substance is used, in proper proportion or not, in dispensing, makes a world of difference. It is a law that controls many important dispensing manipulations and should be carefully studied, however much time it may require to master; it is knowledge that is not acquired so well by practice as by sound reasoning. Sense of proportion is entirely wanting when a dispenser throws a grain of strychnine sulphate in a mortar already containing a dram of quinine sulphate and proceeds to mix them. It is also lacking when he proceeds to make an ordinary solution of potassium bromide in the same manner he would make the usual solution of potassium chlorate. No matter what the relative bulk of the several ingredients may be, if they weigh the same, they are "coons" and all look alike to him. The preparation of an ounce of ointment to contain two percent of yellow mercuric oxide, would be prepared with the same regard for proportion, that he would prepare an equal quantity of an ointment to contain twenty percent of zinc oxide; morphine sulphate is dissolved in much the same manner as Epsom salt.

This law of proportion applies with particular force to the size and uniformity, essential and attractive uniformity, of pills, lozenges, tablets, suppositories and so forth; to the size of powder papers and their relation to powder boxes, and especially to containers. Oh! what dispensing sins are committed by using containers out of proportion to their specific purposes. In labelling, proportion must be very difficult to follow because it is so seldom shown; in the one item of spacing the writing on labels, its absence is more pronounced than any where else. I would feel that I had, by no means, lived in vain, if I could be assured that I had communicated to coming generations of pharmacists, to even a small degree, a better and more helpful appreciation of proportion in its relations to containers, labels and label writing. I am confident I would have added years to my life and much to my fortune, could I have always secured regard for proportion, in my employes.

True esthetics in pharmacy is a thing I have been harping upon for many years, not from a sentimental standpoint, but because I early learned that pharmacy and pharmacists were very "short" on the esthetic and because I had observed that those in other vocations who were "long" on it, were almost invariably successful and, if a personal reference can be excused, I will most positively affirm, with more than forty years of business life behind me, that this fortunate early realization has been my most profitable asset. But it is very difficult to acquire these true esthetic abilities and quite as difficult to apply them to all phases of dispensing. I confess to have made small progress, but the few forward steps I have taken have brought me to interest, to comfort, and I believe and hope, to the holding of much of the public's respect. This is written as the shadows lengthen and not with the slightest tincture of vanity, but simply as encouragement to those who may follow. Others may enjoy a contemplation of the truly beautiful much more intensely than do I, and I am heartily glad if they do, for I am sure they possess a thrilling pleasure that is beyond expression.

The *cause and effect* in dispensing is very difficult to learn. This will bring a smile, I am confident, to the lips of many very learned, so called pharmacists, who are not dispensers and who have had no actual experience with dispensers in

business. It is a person who has seen would-be dispensers, time after time and generation after generation, miscut pills, who realizes that the irregularity follows a want of appreciation of so general a principle as cause and effect. There are thousands and thousands of pharmacists today, with a normal temperature of 98.2° F., who cannot make a presentable cacao-butter suppository by hand, and there are just as many other pharmacists who are living with their blood at exactly the same temperature, who can and do make such suppositories very quickly and successfully. One class cannot be made to understand that the effect of holding the solidified fat between their fingers is to fuse it. Has any one, here, ever closely watched thirty-five or forty different persons fill gelatin capsules with sodium salicylate; the capsules out of the one original container, with identically the same salt, at the same time, in the same atmosphere, at an equal temperature, and notice the results? These results are always exactly consistent with the operator's appreciation of cause and effect.

A dispenser will scarcely presume to call himself accomplished who cannot fold any number of powders of exactly the same size and of a size that will properly fit a box with no other appliance than a spatula and without the aid of the box. Did you ever notice how many give their powders a "twist"; that is fold the ends on different planes? You may tell such dispensers over and over again how this effect is produced, but they will never correct the defect, until they learn themselves to connect the cause with the effect.

This more fundamental consideration of the difficulties of dispensing is nowhere so fruitful in results as in the generally thought, very simple matter of wrapping packages. The bad effects here, from certain very definite causes, are most pronounced. If there is one thing in the art of dispensing that can be reduced to an exact science, it is the wrapping of packages, with results that are not only esthetic, but such as make the very best advertisement. The proof that package wrapping is difficult to learn is strongly presented in the packages that go out of our stores. The cause of bad wrapping is generally too much paper and the absence of a few essential movements of the fingers; the effect is a waste of material and an unattractive, confidence-destroying package.

I trust this broader treatment of the subject, broader than I first intended, has added interest to quite prosiac matters. If to any one, it is not yet quite apparent, what, in my opinion, are some of the most difficult things to learn in dispensing, then to them, I would say: to make "round" pills round and "white" pills white, and the pills of the same lot of exactly equal size; to wrap powders tight, uniform and alike, to mold suppositories easily, without the possibility of mishap or to form them quickly by hand in cold weather or hot; to fill capsules *full*, dry or mass, with the medicament on the inside, only, and the outside clean and bright; to select appropriate containers and label them sensibly, fulfilling the real object of labeling, yet, withal, attractively and finally, to send out packages that look like they came from the hands of a pharmacist, who had been properly trained and not from a hardware store or grocery.

After all, I suppose, the most difficult thing to learn in dispensing is to learn, to really learn, how to dispense.

PRACTICAL PHARMACY AND SYSTEM IN THE PRESCRIPTION DEPARTMENT.

H. G. POSEY, NEW ORLEANS, LA.

Your chairman has with mistaken zeal insisted upon my writing for you a paper on Practical Pharmacy and Dispensing, to be read before the next meeting of that section. I am fully aware of my limitations, but nevertheless there are a few ideas and wrinkles which occur to us all at times and which would be of appreciable benefit were they called to the attention of probable users, and I shall jot them down here.

The writer was actively engaged in prescription and laboratory work for some years, and although now one of that great army of travelling representatives who call upon the drug trade, still maintains a very lively interest in the back portion of the drug store, the place where the mortars and graduates and the pots and pans are used. Practical pharmacy in its truest sense, comprises both preparing and dispensing the various galenicals and other complex substances which enter into the dispensing or prescription work of the drug store. Such being the case, the writer has been shocked to see the tendency of the pharmacist to *buy everything*, and to be content to pour out of the manufacturer's bottle or package into his own, write out the physician's directions, slap on the label, and let it go at that. Practical pharmacy, I take it, necessitates a clean and orderly prescription counter, and scales. Shades of our ancestors! when I think of the condition of some of the prescription scales I have seen I throw up my hands in horror! Dirt incrusted scale pans, small amounts of powdered and crystalline chemicals which have spilled onto the glass portion of a torsion or a Troemner balance and left to remain there until by its hygroscopic nature it had corroded the metal parts and incrusted both the metal and the glass, rendering the balances sensitive to anywhere from one to five grains instead of one-sixty-fourth or one one-hundredth of a grain as they properly should be. Coupled with that, a dirty disorderly arrangements of the stock bottles and a heterogenous collection of graduates, etc., seems to be the condition existing in too many of our stores. How delightful on the other hand to go behind the prescription counter of a store where all is order and system, and where cleanliness is paramount. That fellow is usually the one who is able to compound that batch of difficult pills or suppositories and do it right. In the routine of the busy prescription store a full line of working solutions of the various salts, acids, etc., is always a great help, and such solutions as potassium iodide, potassium bromide, sodium bromide, sodium salicylate of definite strength, boric acid, citric acid, tartaric acid, and others of their class, also a solution of strychnine sulphate, 1 in 60, all of which remain stable for a time if a small quantity of alcohol be added thereto when making up to the required volume. Such solutions can be measured with greater ease and more expeditiously than the corresponding substance can be weighed, made into solution in the vehicle and strained through cotton or filtered; and let me say right here that

had I a man in my employ who sent out a murky liquid when it should have been clear, I would fire him at once.

Practical pharmacy goes still further than the prescription department. How many so called practical pharmacists have we who would make a botch of Fowler's Solution by putting the arsenic trioxide and potassium bicarbonate in a porcelain evaporating dish, adding the water, and then applying heat. What is the result? In the ebullition caused by the heat the bubbles are forced to the surface and bursting there carry a part of the arsenic with them to the rim and over the rim of the dish. If you doubt, it, get your old tripod, scrape some of the incrustation from its rings and apply any arsenic test; or better still, when you have finfished your lot of Fowler's Solution assay it for its arsenical content. I am satisfied that you will in the future use a florence flask. How many of you in making a U. S. P. tincture of an alkaloidal drug, mydriatic or otherwise, know that the drug is thoroughly exhausted before percolation is finished. Do you just rely upon the absence of chlorophyll, or coloring matter in the last few cubic centimeters of the percolate, or do you subject it to the action of say Mayers reagent?

In handling a prescription containing a large qauntity of a glycerophosphate, for instance, which was intended to be in solution, have you ever tried the efficacy of a small quantity of lactic acid?

In making solution of lead subacetate U. S. P. have those of you who have an open steam pipe handy, ever tried coupling a hose on that steam pipe putting the lead oxide, lead acetate and water all together in a stone crock, sticking that hose down into it, turning on the steam and letting the good work go on by itself?

Have any of you ever had to make large quantities of a phosphorous rat and roach paste? No? Well if you ever do, try it this way: Get an ice cream freezer, place the phosphorous in the freezer can, with water enough to cover it. Put it on a water bath until the phosphorous melts, then put in the dasher, pour in fifty percent of the total volume of glucose (syrupy) turn the crank until it is thoroughly mixed, after which add enough previously made flour paste to make up the required volume, then add oil of anise or any other odor desired. That is practical pharmacy from the manufacturing standpoint and just as much practical pharmacy is needed there as behind the prescription counter.

In making large quantities of Aromatic Elixir, U. S. P. have you had trouble in filtering the finished product? Of course you have. Try dissolving the oils or aromatic spirit in part of the alcohol triturating that with talcum in a large mortar, or other vessel, then adding the balance of the alcohol and water, filtering, and adding the syrup last. Have you ever made Compound Resorcin Ointment? Certainly you have, but did you ever try using anhydrous wool fat, dissolving the resorcin in the necessary quantity of water and doing your own hydrating, instead of having the manufacturer to do it for you, and at the same time getting in the resorcin? Try it once. All these things are practical pharmacy and go a very long way toward determining whether or not a man has the ability to make a success in pharmacy.

Section on Historical Pharmacy

Papers Presented at the Sixty-First Annual Convention

A BRIEF HISTORY OF THE MAINE PHARMACEUTICAL ASSOCIATION.

A. G. SCHLOTTERBECK.

The formation of the Maine Pharmaceutical Association was the result of a friendly call from H. T. Cummings at the store of the writer during the month of June, 1867.

The conversation naturally drifted to Pharmacy, its various aspects and conditions, in the State of Maine, and how to elevate it. Various plans to improve the status were considered, culminating in the opinion that a school or college of pharmacy ought to be established to teach the several branches of Chemistry, Materia Medica, Botany and Pharmacy, providing sufficient support could be obtained to make it a success.

With this end in view a circular letter was issued inviting the apothecaries of Maine to attend a convention to be held in Portland, July 23, 1867, to deliberate upon the subject, to which the following responded by their presence:

John G. Cook of Lewiston.	Charles H. Marks of Portland.
Samuel Anderson of Bath.	H. H. Hay of Portland.
Charles K. Partridge of Augusta.	J. H. J. Thayer of Portland.
Alden F. Keene of Gorham.	M. S. Whittier of Portland.
Emmons Chapman of Portland.	William E. Short of Portland.
Harry T. Cummings, of Portland.	A. G. Schlotterbeck of Portland.

All of whom have passed away except the writer.

The assembly was called to order by H. T. Cummings, who stated the subject matter for consideration; a temporary organization was formed with Mr. Cummings as Chairman and Mr. Partridge, Secretary. Upon motion it was voted to form a State Pharmaceutical Association. After discussion of various questions adjournment was made to 2:30. The convention having reassembled, the temporary organization, so far as made, was declared to be the permanent organization to be known by the title of the Maine Pharmaceutical Association.

The following were chosen to complete the list of officers: for

Vice-President—J. G. Cook.
Treasurer—M. S. Whittier.
Corresponding Secretary—A. G. Schlotterbeck.
Executive Committee—H. T. Cummings, H. H. Hay, J. H. J. Thayer, all of whom were elected.

Cummings and Schlotterbeck were appointed to draft and report a constitution and by-laws at the adjourned meeting to be held August 20, 1867.

Thus was formed the *first State Pharmaceutical Association* in the United States.

On August 20, the Committee on Constitution, etc., reported as follows:

Preamble: Whereas, the advancement of Pharmaceutical knowledge and the elevation of the professional character of apothecaries and druggists throughout the State of Maine are dear to us in common with all well-disposed pharmacists

And whereas, a large portion of those in whose hands the practice of pharmacy now exists are not properly qualified for the responsible office it involves, chiefly by the many difficulties that impede the acquirement of a correct knowledge of their business

Therefore, We, the members of a convention now assembled at Portland, Me., July 23, 1867, composed of apothecaries and druggists from different sections of the State of Maine with the object of deliberating on the condition of our profession, do hereby resolve and constitute ourselves into a permanent association to meet annually at such time and places as may hereafter be determined, for more effectually accomplishing the objects for which we are now assembled, and do now adopt the following

CONSTITUTION AND BY-LAWS.

This Association shall be called the Maine Pharmaceutical Association. Its aim shall be to unite the educated and reputable Pharmacists and Druggists of Maine in the following objects (the most salient points being):

To improve and regulate the Drug Market of this State.

To prevent the importation of inferior, deteriorated and adulterated drugs and detecting and exposing home adulteration.

To improve the science and art of Pharmacy.

To regulate the system of apprenticeship.

To suppres Empiricism and as much as possible to restrict the sale of medicines to regularly educated druggists and apothecaries.

The report was accepted and adopted for the government of the Association. The third Tuesday of July of each year was chosen for the annual meeting.

On July 21, 1868, the President reported the act of incorporation as follows:

CHAPTER 513.

An act to Incorporate the Maine Pharmaceutical Association.

CHARTER.

Be it enacted by the Senate and House of Representatives in Legislature Assembled, as follows:

Sect. 1. Henry T. Cummings, John G. Cook, Charles K. Partridge, Moses S. Whittier, Augustus G. Schlotterbeck, Samuel Anderson, Jr., Henry H. Hay and J. H. J. Thayer, and all such persons as are now members of an association known as the Maine Pharmaceutical Association, or shall hereafter become members of the same, are hereby constituted a body politic in law and in fact, to have continuance for twenty-five years, by the name of the Maine Pharmaceutical Association, for the purpose of cultivating, improving, and making known the principles of pharmacy, its collateral branches of science, and the best modes of preparing medicines and their compounds, and of giving instruction in the same, by public lectures or otherwise, as circumstances shall render advisable; and may hold real and personal estate to an amount not exceeding twenty thousand dollars.

Sect. 2. The said association may establish by-laws and rules for its government and regulation, and for the preservation and application of the funds thereof, not repugnant to the constitution and laws of the United States, or of the State of Maine; and shall have power to do all and singular acts as may be proper and necessary for the establishment of said association, and for the promotion and fulfilment of its objects.

Sect. 3. The officers of the association shall be a president, vice-president, recording secretary, corresponding secretary, treasurer and auditor, whose respective duties may be assigned by the by-laws, and who shall be elected by printed or written ballots at the stated

annual meeting on the third Tuesday of July of each year, and any vacancy may be filled by a special election by the members of said association. There shall also be elected at said annual meeting an executive committee of six members, who, with the other officers of the association above enumerated, shall constitute a board of trustees, and whose duties shall be defined by the by-laws, and who shall serve one year or until others are chosen to fill their place. Said board, of which not less than five shall constitute a quorum, shall conduct the ordinary affairs of the association. They may make such rules and regulations, and do such other things for the support and government of the Pharmaceutical Association as they may deem fit and proper, and perform such duties as are or may be from time to time committed to them by said association; their acts, however, to be submitted to the association for revision at each stated meeting of the association.

Sect. 4. The board of trustees shall have power to issue certificates of membership, to adopt rules and regulations in the examination of candidates, and the granting of diplomas to those who shall have attended two full courses of lectures, given under the authority of this association, whenever such shall have been established, or shall have passed a satisfactory examination in a course of study prescribed by the board of trustees, and shall have studied not less than four years, with one or more reputable druggist or apothecary, in the theory and practice of the science and art of pharmacy.

Sect. 5. The association may have the right to issue scrip stock, execute bonds, mortgages, conveyances, and to sell its property, whether in real estate, books, productions of nature or art, under the common seal of the association, and acknowledged by its president, or in any way so dispose of its possessions as to promote pharmaceutical education, and the mutual advancement of its members, and the elevation of the art and business of the pharmaceutist in the community.

Sect. 6. If the annual election for officers of the association and members of the board of trustees for any cause shall not be held on the day before mentioned, the said corporation shall not be thereby dissolved, but the officers and trustees shall continue in office until a new election.

Sect. 7. The corporation hereby created shall be subject to the provisions and possess the general powers specified in reference to kindred and educational societies in the revised statutes of the state of Maine; and the legislature may at any time modify, alter or repeal this act.

Approved February 17, 1868.

It was also voted to hold a semi-annual meeting on the third Tuesday of January each year.

January 19, 1869, the Legislative Committee reported that the petition to the Legislature for apothecaries to be authorized to dispense liquors on physicians' prescription was killed by politicians, leaving matters in the same humiliating and derogatory condition—the apothecary being stigmatized as a rumseller (which in many cases, the writer confesses was true). The public, however, demanded and expected that the apothecary should supply the "ardent" if wanted, notwithstanding that by doing so he was obliged to violate the law and subject himself to the penalties thereof.

The annual meeting of 1869 adjourned without any special business. The Association did not meet again until 1870, when a committee was appointed to consult with the professors of the Boston College of Pharmacy in regard to making arrangements for their delivering a course of lectures in Portland.

On July 16, 1872, the old officers, who had served from the beginning, were again elected and adjournment was made to the third Tuesday of October, which was also selected for the future annuals. A vote to again petition the Legislature to enact the Pharmacy Law, which was indefinitely postponed in 1871, was passed.

OFFICERS OF THE MAINE PHARMACEUTICAL ASSOCIATION FROM 1867 TO 1913.

Year	President.	Vice-President.	2d Vice-President.	3d Vice-President.	Secretary.	Treasurer.	Cor. Sec'y.
1867	H. T. Cummings	John G. Cook			C. K. Partridge	M. S. Whittier	A. G. Schlotterbeck
1868	do	do			Christopher Way	N. S. Harlow	do
1869	do	do			do	do	do
1870	do	do			do	do	do
1871	do	do			do	A. G. Schlotterbeck	Christopher Way
1872	do	do			do	do	do
1873	John G. Cook	Chas. K. Partridge			S. D. Wakefield	H. H. Butler	do
1874	do	do			do	do	do
1875	Chas. K. Partridge	A. G. Schlotterbeck			Hershell Boynton	do	do
1876	do	do			do	Hershell Boynton	
1877	do	do			do	do	
1878	C. A. White	E. Dana, Jr.			Edward Merrill	Ed. Merrill	
1879	E. Dana, Jr.	James B. Totten			S. B. Graves	Thos. G. Loring	
	No meetings.					F. R. Buck	
1890	Chas. K. Partridge	A. M. Robinson			H. E. Bodwich	do	H. T. Cummings
1891	do	do			do	H. B. Pennell	do
1892	Ava Warren	D. W. Heseltine			do	do	John Williamson
1893	do	do			Chas. A. Fowler	John Williamson	do
1894	D. W. Haseltine	Geo. W. Dorr			do	do	Chas. M. Hay
1895	do	do	F. H. Wilson	Wm. Robinson	do	do	do
1896	Geo. W. Dorr	F. H. Wilson	W. A. Robinson	W. F. Norcross	M. L. Porter	Walter I. Drew	C. H. Pendleton
1897	F. H. Wilson	W. A. Robinson	W. F. Norcross	A. M. Robinson	do	do	George A. Parche
1898	W. A. Robinson	A. M. Robinson	G. A. Parcher	Hershell Boynton	do	do	
1899	do	do	do	do	do	do	
1900	Hershell Boynton	F. R. Partridge	D. P. Moulton	F. T. Crane	do	do	
1901	F. R. Partridge	D. P. Moulton	F. T. Crane	G. R. Wiley	do	do	
1902	D. P. Moulton	F. T. Crane	G. R. Wiley	Ed. A. Hay	do	do	
1903	F. T. Crane	G. R. Wiley	E. A. Hay	A. W. Meserve	do	do	
1904	G. R. Wiley	A. W. Meserve	John Williamson	O. W. Jones	do	do	
1905	A. W. Meserve	John Williamson	O. W. Jones	H. J. Hathaway	do	do	
1906	John Williamson	O. W. Jones	H. J. Hathaway	John Coughlin	do	do	
1907	O. W. Jones	H. J. Hathaway	John Coughlin	C. H. Davis	do	do	
1908	H. J. Hathaway	John Coughlin	Chas. H. Davis	Geo. O. Tuttle	do	M. L. Porter	
1909	John Coughlin	Chas. H. Davis	Geo. O. Tuttle	H. F. McCleaon	do	A. W. Meserve	
1910	Chas. H. Davis	Geo. O. Tuttle	H. F. McCleaon	E. W. Murphy	do	do	
1911	Geo. O. Tuttle	E. W. Murphy	F. H. Tupper	W. H. Wood	do	do	
1912	E. W. Murphy	F. H. Tupper	W. H. Wood	D. T. Dougherty	do		

October 20, 1872. Meeting held in Augusta—Officers re-elected—Committee appointed to confer with a similar committee from the Maine Medical Association to have a law enacted requiring physicians and apothecaries to pass an examination before entering upon either profession.

October 17, 1876. The Committee on Legislation was instructed to procure an amendment to the pharmacy bill pending so its provisions for registration and examination shall be mandatory only in their application to towns and cities of not less than two thousand (2,000) population.

A midsummer session for business and social purposes was suggested and adopted.

The Legislature during the winter enacted the first pharmacy law which was as follows:

Chapter 204.

An act to prevent incompetent persons from conducting the business of Apothecaries.

PHARMACY LAW,

Be it enacted by the Senate and House of Representatives in legislature assembled, as follows:

Sect. 1. The governor, with the advice of the council, shall appoint three suitable persons to be commissioners of pharmacy, one of whom shall hold his office for three years, and each until his successor shall be appointed and qualified; and each year thereafter another commissioner shall be so appointed and qualified. If a vacancy occurs in said commission, another shall be appointed, as aforesaid, to fill the unexpired term thereof. Before entering upon the duties of their office, the commissioners shall be sworn to faithfully and impartially discharge the same, and a record thereof shall be made on their commissions.

Sect. 2. Said commissioners shall examine any person who hereafter desires to engage in the business of an apothecary, and if found skilled in pharmacy, shall give him a certificate of that fact, and that he is authorized to engage in the business of an apothecary, and such certificate must be signed by at least two commissioners. They shall register in a suitable book, to be kept in the secretary of state's office, the names and places of residence of all persons to whom they issue certificates, and the dates thereof, and for each certificate of registration given under the provisions of this act, said commissioners shall be entitled to receive from the applicant five dollars, which shall be in full for all services and expenses.

Sect. 3. Every person hereafter entering upon the business of an apothecary shall first be examined by said commissioners, and present to them satisfactory evidence that he has been an apprentice or employed in an apothecary store where physicians' prescriptions are compounded, at least three years, or has graduated from some regularly established medical school, or college of pharmacy, and is competent for the business, and the commissioners may then grant him a certificate and registry as hereinbefore provided.

Sect. 4. Any person engaged in the business of apothecary at the passage of this act may receive a certificate and be registered as aforesaid, on application to said commissioners, and presenting to them satisfactory evidence of his competency therefor.

Sect. 5. Apothecaries registered as herein provided, shall have the right to keep, under such restrictions as the legislature may impose, all medicines and poisons authorized by the United States dispensatory and pharmacopœia as of recognized medicinal utility; *provided*, that nothing herein contained shall be so construed as to authorize the sale of intoxicating liquors.

Sect. 6. If any person shall hereafter engage in the business of an apothecary, who is not now in said business, contrary to the provisions of this act, he shall be subject to a penalty of fifty dollars for each week he shall so continue in such business, to be recovered by an action of debt for the use of any person suing therefor, or by indictment for the use of the county.

Sect. 7. This act shall not apply to physicians putting up their own prescriptions, or to the sale of proprietary medicines.

Approved February 9, 1877.

The provision in regard to registration being misconstrued by some created an active acrimonious opposition against those who had strenuously exerted themselves to obtain the law, nearly disrupting the State Association.

July 16, 1877. The announcement that the business session would be followed next day by a sail down the bay and a clam bake added fifty-four new members.

October 16, 1877. Annual Meeting. Thirty-one were added to roll of membership and though the old officers were re-elected, the control of the Association was to pass into new hands—at the next annual meeting.

July 24, 1878. An entirely new list of officers was elected. The year proved uneventful. The records do not show that the Association was ever presided over by the President-elect.

September 18, 1879. Mr. Dana was elected President. His administration proved unfortunate as the Association passed into a dormant state remaining in same eleven years, during which time no meetings were held, until its revival July 17, 1890, by the re-election of Chas. K. Partridge as President, with a full line of officers. By 1895, the Association seems to have begun to realize and fulfill its mission. The standard of examination had been raised by the Pharmacy Commission. Four papers were contributed and read in the annual meeting, competing for the prize; this was won by W. A. Robinson, subject, "The Apothecary of 1860 versus 1895." All reference to the prohibitory law was ignored.

July, 1896. Dr. M. L. Porter, of Danforth, was elected Secretary, proving such a host in himself that he has been retained in that position ever since. To him is due the greater part of the success achieved by the Association of late.

The Commissioners of Pharmacy were appointed a Sub-Committee on Legislation and obtained the enactment of the Pharmacy Law of 1897.

1898. A new constitution and by-laws were adopted.

1899. The Pharmacy Department of the Maine State University was highly commended by the President in his annual address and has since been endorsed by the Association.

1900. Resolutions were adopted as to the status of the pharmacist in the Army and Navy with petition forwarded for his betterment to the President and Secretary of Army and Navy.

Since the passage of the Pharmacy Law of Maine to the present time, 1913, the following gentlemen have served as Commissioners of Pharmacy for varied periods:

N. S. Harlow
Chas. K. Partridge
H. T. Cummings
J. H. Plaisted
A. G. Schlotterbeck
John H. Hammond
W. H. Jordan
Seth D. Wakefield
Herschel Boynton
J. Q. A. Hawes
Frank R. Partridge
Edward H. Thompson
Noble C. Earle
Percy L. Lord
D. W. Heseltine
Jos. F. Young
Fred H. Wilson
Chas. H. Davis
Frank W. Bucknam
Frank F. Cram
Jas. A. Broe
Ernest L. Cowan

The new Constitution and By-Laws adopted in 1898 are as follows:

THE CONSTITUTION.

Article I.

This Association shall be called the Maine Pharmaceutical Association.

Article II.

The object of this Association shall be to promote the interest of pharmacy by urging the enactment of such laws as will be of mutual advantage to pharmacists and the public, restricting to competent persons the dispensing and sale of medicines, to encourage a more thorough training of assistants, and to bring the pharmacists of this State into more intimate social relations.

Article III.

Section 1. This Association shall consist of active, associate and honorary members.

Section 2. Active members shall consist of legally registered apothecaries of the State, of good moral character and professional standing, whether in business for himself, retired from business or employed by another in a store where drugs and medicines are legally dispensed.

Section 3. Associate members shall consist of persons of good moral character and professional standing who are in business for themselves or employed by another in a store where drugs and medicines are legally dispensed. Commercial travelers who are employed by wholesale druggists, manufacturing chemists, and druggists' sundry houses, actively engaged in soliciting business from the drug trade in the State, are eligible as associate members.

Section 4. Pharmacists, chemists and other scientific men who may be thought worthy the distinction, may be elected honorary members. They will not, however, be expected to pay any dues. Active members only shall be eligible to vote for candidate for Commission of Pharmacy.

Article IV.

The officers shall consist of a president, three vice-presidents, a secretary, an assistant or local secretary (to be elected from the place of the next meeting) and a treasurer, all of whom shall be elected annually, and shall hold office until the election of their successors.

The executive committee shall consist of the president, vice-presidents, secretary and two members to be appointed by the president.

The auditing committee shall consist of the three vice-presidents, who shall examine the accounts of the secretary and treasurer and report at the annual meeting.

Article V.

Section 1. The president, or in his absence or inability to serve, the vice-presidents in their order, shall preside at all meetings of the Association, and administer the rules of order usual in deliberative assemblies, shall call special meetings at the written request of fifteen members, shall present at each annual meeting a report of the affairs of the Association for the past year, together with such suggestions for its future management as may seem to him proper. He shall sign all certificates of membership, and countersign all orders on the treasurer.

He shall approve the bonds of the secretary and treasurer, and keep the same in his custody.

Section 2. The secretary shall collect all moneys due the Association from dues and other sources, paying the same to the treasurer once at least every three months and with the aid of the local secretary keep a faithful record of the proceedings of the Association, and carefully preserve on file all reports, essays and papers of every description received by the Association. He shall keep a roll of the names of the members and their residences, conduct all correspondence of the Association, notify all members four weeks in advance of each annual meeting, notify all members of committees of their appointment and election, and furnish each member of the committee with the names of their associates, and in con-

junction with the executive committee, superintend such publications as the Association may direct, and at each annual meeting render a report of the duties performed by him since the last annual meeting with a report of his accounts, and the names of such members as have not paid their dues for three successive years. He shall receive a salary of one hundred dollars per year.

He shall file a bond in the sum of one thousand dollars, the expense of which shall be paid by the Association. He shall sign all certificates of membership, and draw all orders on the treasurer to be countersigned by the president.

Section 3. The treasurer shall receive all moneys from the Secretary and faithfully care for the same. He shall pay all bills for the Association only upon orders drawn by the secretary and countersigned by the president.

He shall present a report of his accounts at each annual meeting.

He shall receive as salary the sum of fifteen dollars per year. He shall give a bond in the sum of one thousand dollars, the expense of which shall be paid by the Association.

Section 4. The executive committee shall have full power to act for and have general charge of the affairs of the Association, providing that the action of such committee shall not contravene instructions of the Association.

Section 5. This Association may establish for its future government and regulation, such by-laws not in conflict with this constitution as may be deemed proper and advisable.

Section 6. The annual meeting of this Association shall be held at such date and place as the Association shall direct.

Section 7. Every proposition to alter or amend this constitution shall be submitted in writing and received at an annual meeting and may be voted for at the next annual meeting, when, upon receiving the votes of three-fourths of the members present and entitled to vote, it shall become a part of this constitution.

BY-LAWS.

Article I.

Fifteen members shall constitute a quorum for the transaction of business at all meetings.

Article II.

The names of persons applying for membership, with their residences, shall be presented in writing, recommended by two members in good standing and referred to the executive committee, and if reported favorable, the candidates may be balloted for, and if they receive two-thirds of the votes cast, shall be declared elected.

Article III.

The membership fee shall be two dollars, which shall include the dues for the current year, which amount shall accompany the application and be paid to the secretary.

Article IV.

Every member shall pay annually in advance into the hands of the Secretary the sum of two dollars. Any member in arrears at the annual meeting shall not be entitled to vote, and if three years in arrears shall lose his membership.

Article V.

Section 1. The President shall, before the close of each annual meeting, appoint the following committees (of which he shall be a member ex-officio), each to consist of three members, viz.: Committee on the drug market and trade interests; committee on pharmacy; committee on legislation and committee on papers.

Section 2. The committee on the drug market and trade interests shall report at each annual meeting such observations and information on these subjects as may seem to them of interest to the Association.

Section 3. The committee on pharmacy shall report annually respecting the scientific progress, discoveries and investigation during the year.

Section 4. The committee on legislation shall compile for reference the laws of the dif-

ferent states regulating the practice of pharmacy and the sale of medicines, and report at each annual meeting what important changes, if any, have occurred during the year, and what additional legislation shall be desirable in this State.

Section 5. The committee on papers shall invite members and others, as they deem proper to prepare and present papers on subjects of interest to the profession, and shall have general management of any prize offered by the Association.

Section 6. Special committees may be appointed as occasion requires, but such committees shall be limited to the scope of the resolution under which they act.

Article VI.

This Association shall annually elect five delegates to the American Pharmaceutical Association, and they shall present their report at the next annual meeting of this Association. Delegates to other Pharmaceutical Associations shall be appointed by the President.

Article VII.

Any amendment to these by-laws must be made in writing, read before the Association at one sitting and laid over to a subsequent sitting, when upon receiving the votes of two-thirds of the members present, it shall become a part of these by-laws.

FEE-SPLITTING.

This is a practice which leads to several indictments. It induces family physicians to betray the sacred confidences of their trusting patients and refer them not to those men who are most competent and who offer the greatest possibility of the saving of life and the preservation of health, but to men who pay for the victim. It lowers the dignity and value of the services of the family physician, who is presumably rendering valued services for nothing, and gives a magnified value to surgery, which is presumably receiving all. How much more exalted would be the standing of the general practitioner if people were taught to value his services in diagnosis and his responsibility in counseling surgery and recommending a surgeon and that they should pay for this service as they would for any other. It should be the privilege of the surgeon to aid the physician openly to secure this just compensation. As a rule the patient is robbed, paying two fees instead of one, as he supposes. Fee-splitting is the stepping-stone by which incompetent men secure business. It penalizes honesty in the young surgeon who is capable but must sit idly by and starve while his less competent competitor buys the business. It leads to many unnecessary operations with their attendant risk and expense performed merely because the patient can be induced to submit and has the price. It is a betrayal of trust, encourages dishonesty, breeds incompetency and should in short, be held a crime. Dr. Jabez N. Jackson, Kansas City, Mo., before the Western Surgical Association, St. Louis, Dec. 19, 1913.—*Journ. Am. Med. Assn.*

Contributed and Selected

UNITED STATES PHARMACOPŒIA.

NINTH REVISION.

ABSTRACT OF PROPOSED CHANGES WITH NEW STANDARDS AND DESCRIPTIONS.

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PART II—FIRST PROOF.

A second installment of the abstract of proposed new descriptions and standards, and of changes in descriptions and standards is herewith submitted.

This abstract embraces most of the drugs of vegetable and animal origin. Many descriptions have been amplified or added and it has been found necessary to present these in full.

Where no reference is made to definitions and descriptions it is understood that the material facts remain the same as in the United States Pharmacopœia, Eighth Revision.

Other abstracts will be submitted later. Comments should be sent to the Chairman of the Revision Committee, Joseph P. Remington, 1832 Pine street, Philadelphia, before May 1, 1914.

Acacia.—The air-dried gummy exudation of Acacia Senegal Willdenow, and other African species of Acacia. In ovoid, more or less spheroidal tears or in broken, angular fragments from 2 to 30 mm. in diameter, varying from whitish, yellowish-white to light amber-colored. Slowly and almost completely soluble in twice its weight of water, the solution having a slight, characteristic odor. The requirement that it should not reduce alkaline cupric tartrate V. S. is omitted. Powder: Not more than 1 percent. should be insoluble in water (limit of plant tissues, sand, and dirt). The powder should contain not more than 15 percent. of moisture.

Aconitum.—Not more than 5 percent. of stem-bases or other foreign matter should be present. More or less conical or fusiform, from 4 to 10 cm. in length, from 1 to 2 cm. in diameter at the crown; externally dark brown or grayish-brown, smooth or longitudinally wrinkled, the upper end with a bud, remains of bud-scales or stem-scars, the other portions with numerous root-scars or short rootlets; fracture short, horny or somewhat mealy; internally, bark light or dark brown, 1 to 2 mm. in thickness, cambium zone usually 5- to 8-angled, with a small fibro-vascular bundle in each angle, pith whitish or light brown, 2 to 7 mm. in diameter; odor very slight; taste sweetish, soon becoming acrid and developing

*Permission to reprint for purposes of comment can be had on application to the Chairman of the Board of Trustees, J. H. Beal, Scio, Ohio.

a tingling sensation, followed by numbness. Under the microscope transverse sections made near the middle of the tuberous root of Aconite show an epidermis replaced by a layer consisting of one or more rows of cells with blackish-brown walls; a primary cortex of 8 to 15 rows of parenchyma and characteristic stone cells, occurring either singly or in small groups; a more or less modified endodermis; a secondary cortex, consisting chiefly of starch-bearing parenchyma and interspersed with a few small fibro-vascular bundles; a more or less star-shaped and characteristic cambium with from 5 to 12 collateral fibro-vascular bundles; and a pith composed of large parenchyma cells filled with starch. Powder: Grayish-brown; starch grains numerous, spherical, somewhat plano-convex, single or 2- to 5-compound, the individual grains from 0.003 to 0.015 mm. in diameter and frequently with a central cleft; tracheæ mostly with slit-like, simple pores, sometimes with spiral or reticulate thickenings or with bordered pores; stone cells single, tabular, irregular in shape or elongated to fibers from 0.100 to 0.400 mm. in length, walls from 0.008 to 0.025 mm. in thickness, strongly lignified and having large simple pores; fragments of cork few, yellowish-brown; fragments of parenchyma numerous, the cells being filled with starch grains; bast-fibers from stems few, very long, with lignified walls about 0.005 mm. thick, and marked by transverse or oblique, slit-like pores. Ash not exceeding 6 percent.

Agar-Agar.—The dried mucilaginous substance extracted from Gracilaria (Sphaerococcus) lichenoides Greville and other marine algæ growing along the eastern coast of Asia, particularly several species of Gelidium or Gloiopeltis (Class Rhodophyceæ. Mostly in bundles from 4 to 6 dm. in length, consisting of thin, translucent, membraneous, agglutinated pieces from 4 to 8 mm. in width; externally yellowish-white or brownish-white, shiny; tough when damp, brittle when dry; odor slight; taste mucilaginous. A fragment mounted in water and examined under the microscope gradually becomes more transparent, showing a granular structure and a few diatoms, notably the frustules of Arachnoidiscus Ehrenbergii Baillon, which are disk-shaped, from 0.100 to 0.200 mm. in diameter, and also fragments of the spiculæ of sponges; upon the addition of iodine some of the granules or hyphal-like portions are colored bluish-black. Insoluble in cold water, slowly soluble in hot water. A solution made by boiling 0.100 Gm. of Agar-agar in 100 Cc. of water, upon cooling, should yield no precipitate upon the addition of tannic acid T. S. (gelatin) and should not produce a blue color upon the addition of iodine T. S. (starch). One part of Agar-agar boiled for about ten minutes with 100 parts of water, and replacing the water lost by evaporation, should yield a stiff jelly upon cooling. Powder: Pale buff; when mounted in water and examined under the microscope it shows transparent, more or less granular, striated angular fragments. In some mounts occasional frustules of diatoms are present; with iodine T. S., fragments for the most part are colored bright red, certain more or less definite areas being stained bluish-black. Ash not exceeding 5 percent.

Aloe.—Definition: The inspissated juice of the leaves of Aloe Perryi Baker, yielding Socotrine Aloes; or Aloe vera (Linné) Webb, yielding Curaçao Aloes; or of Aloe ferox Miller, yielding Cape Aloes (Fam. Liliaceæ). Socotrine Aloes: In yellowish-brown to blackish-brown, opaque, or smooth and glassy masses; fractured surface somewhat conchoidal; sometimes soft or semi-liquid;

odor aromatic or saffron-like, never fetid or putrid; taste nauseous, bitter. Not less than 50 percent. of Socotrine Aloes should be soluble in cold water, the solution being of a yellowish color. Powder: Very dark brown; when mounted in one of the fixed oils and examined under the microscope it shows yellowish or reddish-brown, irregular, or angular fragments. Upon the addition of nitric acid, it yields a yellowish or reddish-brown solution. Curaçao Aloes: In orange to blackish-brown, opaque masses; fractured surface uneven, waxy, somewhat resinous; odor characteristic but not aromatic as in Socotrine Aloes. Not less than 60 percent. of Curaçao Aloes should be soluble in cold water, the solution being of a purplish-red color. Powder: Deep reddish-brown; when mounted in one of the fixed oils, and examined under the microscope it shows numerous blackish-brown or reddish-brown, irregular angular, more or less opaque fragments. Upon the addition of nitric acid it yields immediately a deep red solution. Cape Aloes: In reddish-brown or olive-black masses, usually covered with a yellowish powder; in thin, transparent fragments, of a reddish-brown color; fracture smooth and glassy; odor characteristic. Not less than 60 percent. of Cape Aloes is soluble in cold water, the solution being of a pale yellow color. Powder: Greenish-yellow changing to light brown on aging; when mounted in one of the fixed oils and examined under the microscope it shows numerous, distinctly angular, bright yellow fragments. Upon the addition of nitric acid it yields a solution that is colored reddish-brown, changing to purplish-brown and finally greenish. The tests which follow apply to Socotrine, Curaçao and Cape Aloes: Aloes should contain not more than 10 percent. of moisture. If to 1 Gm. of Aloes 50 Cc. of alcohol be added, the mixture first gently heated and then cooled, a nearly clear solution should be obtained (gum and inorganic impurities). Intimately mix 1 Gm. of Aloes with 10 Cc. of hot water and dilute 1 Cc. of this mixture with 100 Cc. of water; a green fluorescence should be produced upon the addition of a 5 percent. solution of sodium borate. Dilute 1 Cc. of the original aqueous mixture of Aloes with 100 Cc. of water, shake it with 10 Cc. of benzene; upon separating the benzene solution and adding to it 5 Cc. of ammonia water, a deep rose color, which is permanent, should be produced in the lower layer. Ash not exceeding 4 percent.

Althæa.—The root of Althæa officinalis Linné (Fam. Malvaceæ) deprived of the brown, corky layer and small roots, and carefully dried. Root: Usually cut into small pieces about 5 mm. in diameter, of a uniform grayish-white color and otherwise having the characters of entire roots; occasionally entire, slenderly tapering, attaining a length of 30 cm. and a thickness of 2 cm.; externally whitish, longitudinally furrowed, frequently spirally twisted and covered with the somewhat loosened bast-fibers; fracture of bark fibrous, of wood short and granular; internally yellowish-white, bark from 1 to 2 mm. thick, porous, due to mucilage cells, and separated from the slightly radiating wood by a distinct, grayish, cambium zone; odor slight; taste sweetish, mucilaginous. Powder: Whitish; starch grains, numerous, from 0.005 to 0.020 mm. in diameter, usually with a long cleft at the point of origin of growth; sclerenchymatous fibers in groups, the walls being quite thick and more or less lignified; tracheæ with scalariform thickenings or with bordered pores; calcium oxalate crystals few, in rosette aggregates, 0.020 mm. to 0.030 mm. in diameter. Add 1 Gm. of Althæa

Root to 10 Cc. of cold water, allow it to stand with occasional stirring, and filter it through cotton; a pale yellow colored mucilage should be obtained, which should be neutral to litmus, and colored a deep yellow on the addition of a few drops of potassium hydroxide T. S. The mucilage should not have a sour or ammoniacal odor. Ash not exceeding 8 percent.

Amygdala Dulcis.—Powder: Creamy-white, exhibiting numerous very small oil globules, 0.001 mm. or less in diameter, larger oil globules and crystalloids, the latter sometimes with adhering globoids; fragments of parenchyma of endosperm, containing oil globules and aleurone grains; also occasional fragments of seed-coat with characteristic, more or less scattered, large elliptical, thin-walled, strongly lignified epidermal cells and narrow, closely spiral tracheæ. Starch grains are absent. Ash not exceeding 4 percent.

Amylum.—Taste slight, characteristic. Residue on incineration changed from "not more than 1 percent." to "not more than 0.5 percent."

Anisum.—Definition requires the dried ripe fruit with not more than 3 percent. of foreign seeds and other vegetable matter. Fruit: The cremocarp broadly ovoid or pyriform, laterally compressed, 3 to 6 mm. in length, 2 to 3 mm. in breadth; mericarps usually cohering and attached to a slender pedicel 2 to 12 mm. in length, summit with a ring-like disk and 2 projecting, diverging styles; externally grayish or greenish-gray, seldom grayish-brown, slightly pubescent; each with five light brown, filiform ridges and in cross-section with from 15 to 45 vittæ or oil tubes; odor and taste agreeable and aromatic. Under the microscope transverse sections of Anise show an epidermal layer with numerous papillæ and short, one-celled, non-glandular hairs having very thick, papillose walls; primary ribs each with a small, fibro-vascular bundle, surrounded by a few sclerenchymatous fibers; vittæ or oil tubes, 13 to 56 in number, extending as a more or less interrupted circle in the tissues of the mesocarp on the dorsal side of each mericarp; 2 large vittæ on the commissural surface, each separated from the other tissues of the mericarp by a large cavity due to shrinkage of the seed-coat; inner epidermis of pericarp consisting of a layer of narrow tangentially elongated cells closely united with the seed-coat, the inner walls of which are yellowish-brown and considerably thickened; endosperm of polygonal, thick-walled cells, filled with spherical or ellipsoidal aleurone grains, each containing a small rosette aggregate of calcium oxalate; the aleurone grains surrounded with an oily protoplasm, the oil of which is liberated upon mounting sections in hydrated chloral T. S., and appearing in the form of small globules; epidermal layer near the middle of the commissural surface composed of 2 or 3 rows of cells with thick, porous walls, and beneath which occur small groups of thick-walled cells resembling stone cells. Powder: Yellowish-brown, consisting of numerous irregular fragments of pericarp showing portions of the yellowish vittæ, fragments with tracheæ and sclerenchymatous fibers of carpophore; cells of endosperm filled with aleurone grains, 0.006 mm. in diameter, each usually enclosing a rosette aggregate crystal of calcium oxalate 0.002 mm. in diameter; non-glandular hairs 1-celled, from 0.025 to 0.200 mm. in length, either straight or curved and with numerous, slight, centrifugal projections on the outer surface. Ash not exceeding 10 percent.

Apocynum.—The dried rhizome and roots of Apocynum cannabinum Linné

(Fam. Apocynaceæ), with not more than 5 percent. of stems and other foreign matter. Cylindrical, somewhat branched, of varying length, from 3 to 10 mm. in thickness; externally reddish-brown to grayish-brown, longitudinally wrinkled and occasionally with transverse fissures, having vertical sides, extending through the bark; fracture short; internally, bark light brown, 1.5 to 3 mm. in thickness, wood faintly radiate and with large tracheæ, a small pith occurring in pieces of the rhizome; almost inodorous, taste starchy, afterwards becoming bitter and somewhat acrid. Under the microscope sections of Apocynum show numerous laticiferous vessels in both the bark and pith. Stems of Apocynum have a comparatively thin fibrous bark, a light brown porous wood and a large, hollow pith. Powder: Light brown, starch grains numerous, from 0.003 to 0.015 mm. in diameter, spherical, ellipsoidal, ovate, pyriform or more or less irregular, sometimes more or less altered, swollen, and with a hyaline central cleft; numerous fragments of strongly lignified wood-fibers, associated with tracheæ mostly having bordered pores, occasionally with spiral thickenings; fragments of cork layer few, the walls being of a reddish-brown color; an occasional fragment with laticiferous tissues; stone cells few or absent. (Apocynum androsæmifolium Linné.)

Arnica.—Florets: Consisting chiefly of the tubular and ligulate flowers, occasionally with the involucre and receptacle present; involucral bracts narrowly lanceolate, about 1 cm. in length, dark green and pubescent; receptacle slightly convex, deeply pitted and densely short-hairy; ray flowers bright yellow, the ligulate portion, 2 cm. in length, more or less folded lengthwise, 3-toothed, 7- to 12-veined, pistillate; tubular flowers perfect, reddish-yellow, stamens without a tail-like appendage (distinguished from anthers in flowers of Inula Helenium Linné, which have two bristles or long tails at the base); the achenes spindle-shaped, 5 to 7 mm. in length, dark brown, finely striate, glandular-pubescent and surmounted by a pappus a little longer than the achene and composed of a single circle of nearly white barbellate bristles; odor characteristic and agreeable; taste bitter and acrid. Powder: Yellowish-brown, pollen grains numerous, from 0.025 to 0.035 mm. in diameter, spherical, triangular in section and spinose; non-glandular hairs of three kinds, either unicellular, 4- to 6-celled, or consisting of a pair of united unicellular hairs with numerous pores in the dividing wall; glandular hairs of three kinds, either with a large unicellular stalk and a unicellular, glandular head or with a 4-celled stalk and a unicellular glandular head, or a stalk of a double row of 5 cells and a 2-celled glandular head; pappus consisting of a multicellular axis with unicellular branches. Ash not exceeding 9 percent.

Asafœtida.—The gum-resin, obtained by incising the rhizomes and roots of Ferula Asafœtida Linné and Ferula fœtida Regel and of other species of Ferula (Fam. Umbelliferæ) indigenous to Persia and adjacent countries, yielding not less than 60 percent. of alcohol-soluble constituents. A soft, putty-like mass, sometimes almost semi-liquid, or in irregular, more or less pliable hard masses composed of agglutinated tears of variable size embedded in a yellowish-brown or dark brown matrix, or in loose, ovoid tears, from 1 to 4 cm. in diameter, the surface being sometimes streaked a violet, yellowish-red or brownish-red and with a few vegetable fragments; when fresh the mass is either soft or tough, becoming hard and occasionally even brittle on drying; the surface of the freshly fractured tears is milky-white and opaque, changing gradually to a

pinkish or reddish-purple or even reddish-brown on exposure; on moistening with water, the tears become milky-white; odor persistent, alliaceous; taste bitter, alliaceous and acrid. Triturate one part of Asafœtida with three parts of water; it should form a milk-white emulsion which should become yellowish on the addition of alkalies. Heat a fragment of one of the tears of Asafetida with sulphuric acid; a reddish-brown solution should be formed; greatly dilute the latter with water, filter, and add an excess of any of the alkalies, the solution should acquire a blue fluorescence, becoming more pronounced upon the addition of a slight excess of ammonia water. An alcoholic solution of the tears, on the addition of a few drops of phloroglucinol T. S. and a few drops of hydrochloric acid should become of a cherry-red color. Add a few drops of ferric chloride T. S. to a portion of the alcoholic solution of Asafetida, obtained in the assay process given below; an olive-green color should be produced (most foreign resins). Add hydrochloric acid to another portion of the same alcoholic solution until a faint turbidity results; a bluish-green color should be developed, which fades on standing (galbanum). Evaporate enough of the same alcoholic solution, representing 5 Gm. of Asafetida, to 25 Cc., mix it with 25 Cc. of purified petroleum benzin in a separatory funnel and afterwards add twice its volume of water; the mixture and the petroleum benzin layer, after washing with water and subsequent separation, should exhibit no green color when shaken with 30 Cc. of a freshly made aqueous solution of copper acetate (1 in 20) (rosin). Mix 2 Cc. of emulsion of Asafetida with 5 Cc. of water and add 5 Cc. of sodium hypobromite T. S., so as to form a separate layer; a red color should not be produced (ammoniac). Ash of the gum-resin not exceeding 15 percent.. Powder: Powdered Asafetida may be prepared by drying the gum-resin over freshly burnt lime or by exposing it to currents of warm air until it ceases to lose weight, and then reducing it to a powder at a low temperature. Diluents of starch or magnesium carbonate may be added in order to maintain the powdered form. The color of powdered Asafetida is light brown. Not less than 50 percent. should be soluble in alcohol. Ash of the powder not exceeding 30 percent. Assay: Place about 10 Gm. of Asafetida in a tared, 250 Cc. Erlenmeyer flask, determine the exact weight of the drug, add 100 Cc. of alcohol, and, having connected the flask with an upright condenser, boil the mixture in the flask during one hour or until the drug is disintegrated completely. Then transfer the contents of the flask to two counterpoised, plainly folded filters, one within the other, so that the triple fold of the inner filter is laid against the single side of the outer, and wash the flask and filter with consecutive, small portions of boiling alcohol until the washings no longer produce a cloudiness when dropped into water. Collect and reserve the mixed alcoholic solutions and dry the filters and flask to a constant weight at a temperature of about 115° C. Now determine the weight of the residue on the filter and in the flask and calculate its percentage from the amount of Asafetida originally taken. This percentage of alcohol-insoluble material, when subtracted from 100, will give the percentage of alcohol-soluble constituents contained in the Asafetida.

Aspidium.—The "uncomminuted rhizome and stipes" should be collected in the autumn, freed from the roots and dead portions of rhizome and stipes and dried at a temperature not exceeding 70° C. Usually with the blackish-brown

outer layers removed; rhizome 1 to 3 cm. in thickness, cylindraceous and nearly straight, or curved and tapering toward one end, usually split longitudinally, roughly scarred with remains of the stipe-bases, or bearing several coarse longitudinal ridges and grooves, stipes cylindrical, 3 to 5 cm. in length, about 6 mm. in thickness, nearly straight, or somewhat curved, tapering toward one end, and with occasional elongated patches of the still-adhering, blackish-brown outer-layers; fracture short, pale green in the inner half, the texture rather spongy, and exhibiting in an interrupted circle from 6 to 12 vascular bundles, each surrounded with an endodermis; odor slight; taste sweetish, astringent, bitter and acrid. Ash not exceeding 3 percent.

Aurantii Amari Cortex.—Rind from "unripe" fruit of Citrus Aurantium amara Linné. In narrow, thin bands (ribbons), or more often elliptical, flattened, more or less curved pieces (quarters), varying from 3 to 6 cm. in length; outer surface convex; varying from reddish-brown (ribbons) to greenish-brown (quarters), coarsely reticulate and with the edges recurved; inner surface concave, whitish, with numerous conical projections and yellowish-white, linear, more or less anastomosing, fibro-vascular bundles; fracture hard; cross section light brown, somewhat spongy, outer layer with 1 or 2 rows of oil reservoirs; odor fragrant; taste aromatic and bitter. Powder: Yellowish-white or light brown; fragments of parenchyma cells numerous, the walls from 0.004 to 0.012 mm. in thickness; few fragments of tracheæ with close spiral markings or simple pores; occasional membrane crystals of calcium oxalate in monoclinic prisms, from 0.020 to 0.035 mm. in diameter. Powdered Bitter Orange Peel should be colored yellowish upon the addition of potassium hydroxide T. S. Ash not exceeding 7 percent.

Aurantii Dulcis Cortex.—The outer rind of the fresh, ripe fruit of Citrus Aurantium sinensis Gallesio (Fam. Rutaceæ). The outer, orange-yellow layer recently separated by grating or paring and consisting of epidermal cells, parenchyma cells of the sarcocarp, with chromoplastids, oil reservoirs and globules of volatile oil; odor highly fragrant; taste pungently aromatic.

Belladonnæ Folia.—The dried leaves and tops with not more than 10 percent. of stems; usually much twisted and matted together; leaves much crumpled, when soaked in water and spread out, from 6 to 20 cm. in length, 4 to 12 cm. in breadth, broadly ovate, summits acute, margins entire, narrowed into the long petioles; upper surfaces brownish-green; lower surfaces grayish-green, epidermis more or less papillose and slightly hairy; flowers with yellowish-purple, campanulate corollas; fruits globular; fruits dark green or greenish-brown, subtended by a dark green calyx, and with numerous small seeds; odor distinct, heavy, especially on moistening; taste somewhat bitter and acrid. Stems of variable length, not exceeding 7 mm. in diameter, longitudinally wrinkled, older parts smooth and usually hollow, younger parts flattened and finely hairy. Powder: Dark green, consisting of irregular fragments of leaf tissues and woody elements, calcium oxalate in sphenoidal micro-crystals; hairs few, the non-glandular being simple 2- to 5-celled, and the glandular with stalks of 1 to 3 cells; tracheæ with annular, spiral, scalariform or reticulate thickenings and with bordered pores; starch grains and pollen grains few; occasional fragments of the stems of Belladonna with long, thin-walled and slightly lignified bast-fibers.

Raphides should not be present (leaves and stems of Phytolacca decandra Linné). Ash not exceeding 20 percent.

Belladonnæ Radix.—The dried root with not more than 10 percent. of its stem-bases; cylindrical or somewhat tapering, usually split into longitudinal pieces, of 0.5 to 2.5 cm. in thickness; externally pale brownish-gray, longitudinally wrinkled, outer layers of the periderm rather soft, frequently abraded, and thus showing lighter patches; fracture nearly smooth, mealy, and emitting a characteristic puff of dust consisting chiefly of starch grains; internally whitish, with a distinct cambium zone and yellowish wood wedges; nearly inodorous; taste sweetish, afterwards bitterish and strongly acrid. Transverse sections of Belladonna Root, when moistened with iodine T. S., should be colored bluish-black and by transmitted light should show an imperfectly radiate structure within and near a conspicuous cambium line. Under the microscope sections exhibit a bark and wood composed mainly of parenchyma, the cells being filled with starch grains, single and 2- to 6- or more compound, the individual grains being somewhat spherical and from 0.003 to 0.030 mm. in diameter. A section cleared with hydrated chloral T. S. should show occasional cells of parenchyma filled with sphenoidal micro-crystals of calcium oxalate in both bark and wood; bark free from bast-fibers; wood containing scattered groups of large tracheæ with simple and bordered pores or reticulated thickenings, and associated in older roots with wood-fibers. Stem fragments of Atropa Belladonna occur either separate or attached to the roots, light brown or greenish-brown, finely, longitudinally wrinkled, with transverse leaf-scars, pith frequently hollow. Under the microscope sections of Belladonna stem show an outer epidermis with slightly cuticularized walls; a primary cortex of parenchyma, the cells being separated by large, intercellular spaces; an endodermis, beneath which occur in an interrupted circle bast-fibers either singly or in small groups, the walls of which are relatively thin and slightly lignified; a few layers of sieve; a central cylinder of a few tracheæ with numerous wood-fibers; an internal phloem with isolated, small groups of bast-fibers similar to those found in the inner bark; pith, if present, with large irregular parenchyma cells. Powder: Light-brown; starch grains numerous, from 0.003 to 0.030 mm. in diameter, spherical, plano-convex, polygonal, and 2- to 6- or more compound; sphenoidal micro-crystals numerous, from 0.003 to 0.010 mm. in length; fragments of cork cells and tracheæ with wood-fibers few. Occasional fragments of stems of Belladonna showing long thin-walled and slightly lignified bast-fibers. Ash not exceeding 7 percent.

Benzoinum.—A balsamic resin obtained from Styrax Benzoin Dryander, and other species of Stryax (Fam. Styraceæ) growing in the East Indies, and known in commerce as Sumatra Benzoin and Siam Benzoin. Sumatra Benzoin: In blocks or lumps of varying size, made up of tears, compacted together with a reddish-brown, reddish-gray, or grayish-brown resinous mass; tears externally yellowish or rusty-brown, milky-white on fresh fracture; very hard, becoming soft on warming; odor aromatic, upon digesting with boiling water, suggesting the odor of cinnamic acid or storax; taste aromatic and slightly acrid, the resin gritty on chewing. Heat a few fragments of Sumatra Benzoin in a test-tube; a sublimate should be formed consisting of plates and small, rod-like crystals that strongly polarize light. Add carefully an ethereal solution of Sumatra Benzoin

to a small quantity of sulphuric acid contained in a porcelain dish; the solution should be colored a brownish-red. Not less than 75 percent. of Sumatra Benzoin should dissolve in alcohol; the alcoholic solution, upon the addition of water, should become milky and give an acid reaction to litmus. Ash not exceeding 2.5 percent. Siam Benzoin: In pebble-like tears of variable size, compressed, yellowish-brown to rusty-brown externally, milky-white on fracture, separate or very slightly agglutinated; fracture short; odor agreeable, balsamic, vanilla-like; taste slightly acrid, the resin becoming plastic on chewing. Heat a few fragments of Siam Benzoin in a test-tube; a sublimate should be formed directly above the melted mass consisting of numerous, long, rod-shaped crystals, which do not strongly polarize light. Add carefully an ethereal solution of Siam Benzoin to a small quantity of sulphuric acid contained in a porcelain dish; the solution should be colored purplish-red. Not less than 90 percent. of Siam Benzoin should dissolve in alcohol; the alcoholic solution upon the addition of water should become milky and give an acid reaction to litmus. Ash not exceeding 2 percent. The tests which follow apply to both Sumatra and Siam Benzoin: Heat gently 1 to 2 Gm. of either Sumatra or Siam Benzoin with 15 Cc. of petroleum benzin, and after cooling transfer the supernatant liquid to a separator. Wash with 10 Cc. of a saturated aqueous solution of sodium bicarbonate, draw off and discard the aqueous layer and then wash the mixture in the separator with water until it is free from bicarbonate. On adding 20 Cc. of an aqueous solution of copper acetate (1 in 200) and vigorously shaking the mixture, no green color should be observed in the petroleum benzin layer (rosin and foreign resins). Treat 1 Gm. of powdered Benzoin with 15 Cc. of warm carbon disulphide, filter the solution, wash the filter with an additional 5 Cc. of carbon disulphide and allow the mixed liquids to evaporate spontaneously. A residue, weighing not less than 0.125 Gm. and corresponding to the identification tests under Acidum Benzoicum, should remain.

Buchu.—The dried leaves of Barosma betulina (Thunberg) Bartling and Wendland, known in commerce as Short Buchu; or of Barosma serratifolia (Curtis) Willdenow, known in commerce as Long Buchu (Fam. Rutaceæ), with not more than 10 percent. of stems and other foreign matter. Short Buchu: Rhomboidally oval or obovate; from 9 to 25 mm. in length and 4 to 13 mm. in breadth; summit obtuse, and recurved; margin somewhat serrate or finely dentate with an oil gland at the base of each tooth; the base more or less wedge-shaped; yellowish-green, some being light brown; glandular punctate; both surfaces papillose, under surface longitudinally striate; petiole 1 mm. in length; texture coriaceous; odor and taste characteristic, aromatic and mint-like. Long Buchu: Linear-lanceolate, 2.5 to 4 cm. in length, 4 to 6 mm. in breadth, summit somewhat rounded or truncate with an oil gland at the apex; margin sharply serrate and glandular, otherwise resembling Short Buchu. Stems in both Short and Long Buchu about 1 mm. in diameter, yellowish-green or brownish-red, cylindrical, longitudinally furrowed, with prominent leaf-scars nearly opposite to each other and giving the stems a-jointed character. Ash not exceeding 4 percent.

Calumba.—In circular or oval disks attaining a diameter of 9 cm. and seldom exceeding 22 mm. in thickness, or in longitudinal or oblique slices attaining a length of 30 cm., a breadth of 35 mm. and a thickness of 16 mm.; externally brown and roughly wrinkled; cut surface varying from yellowish-brown to gray-

ish-yellow, with a few interrupted circles of fibro-vascular bundles, the transverse slices distinctly radiate in the outer portion and with a dark cambium, central portion often depressed; fracture short, mealy; odor slight; taste slightly aromatic, very bitter. Powder: Greenish-brown to grayish-yellow; starch grains numerous, mostly single, occasionally 2- to 3-compound, the individual grains from 0.003 to 0.085 mm. in the long diameter, ovoid, ellipsoidal, frequently very irregular, slightly lamellated, with an excentral, linear, x-shaped or branching cleft; stone cells few with irregularly thickened, strongly lignified, coarsely porous walls and containing one or more prisms of calcium oxalate 0.010 to 0.030 mm. in length or numerous sphenoidal micro-crystals; fragments with tracheæ few, the latter with reticulate thickenings, or bordered pores, and associated with wood-fibers having long, oblique, slit-like pores. Ash not exceeding 8 percent.

Cambogia.—When rubbed with water it should yield a yellow emulsion becoming darker and almost transparent upon the addition of ammonia water. The emulsion should not turn green upon the addition of iodine T. S. (starch). Powder: Bright yellow, containing few or no starch grains. When mounted in hydrated chloral T. S. and examined under the microscope, the particles, for the most part, should slowly dissolve, leaving scattered fragments of vegetable tissues. Not less than 65 percent. soluble in alcohol. Ash not exceeding 2 percent.

Cannabis.—The dried flowering tops of the pistillate plants of Cannabis sativa Linné, or of the variety indica Lamarck, (Fam. Moraceæ), freed from the thicker stems and large foliage leaves and with not more than 10 percent. of mature fruits (seeds). In dark green, more or less brownish, compressed, and more or less agglutinated, resinous fragments, consisting of the short stems with their leaf-like bracts and pistillate flowers, a few of the latter being sometimes replaced with more or less developed fruits; stems cylindrical, of varying length, not more than 3 mm. in diameter; longitudinally furrowed, light green to light brown, strigose-pubescent; leaves digitately compound; leaflets, when soaked in water and spread out, linear-lanceolate, nearly sessile, margin deeply serrate; bracts ovate, pubescent, each enclosing 1 or 2 pistillate flowers, or more or less developed fruits; calyx dark green, pubescent and somewhat folded around the ovary or fruit; styles 2, filiform and pubescent; ovary with a single campylotropous ovule; fruit light green to light brown, broadly ellipsoidal, about 3.5 mm. in length; finely wrinkled and slightly reticulated; odor agreeably aromatic; taste characteristic. Powder: Dark green, giving a strong effervescence on the addition of dilute hydrochloric acid; numerous sharp-pointed fragments of upper portion of non-glandular hairs; fragments of bracts and leaves showing yellowish-brown laticiferous vessels, rosette aggregates of calcium oxalate and bases of non-glandular hairs; rosette aggregates of calcium oxalate from 0.005 to 0.025 mm. in diameter; non-glandular hairs, unicellular with a very slender pointed apex and a considerably enlarged base containing, usually in the lumen, some calcium carbonate; glandular hairs of two kinds, one with a short one-celled stalk and the other with a multicellular, long, tongue-shaped stalk, the glandular portion being globular and consisting of from 8 to 16 cells; fragments of fruits with palisade-like, non-lignified sclerenchymatous cells, walls yellowish-brown, finely porous and lumina usually containing air; tissues of embryo and endosperm with numer-

ous oil globules and aleurone grains, the latter from 0.005 to 0.010 mm. in diameter and consisting of large crystalloids and globoids. Alcoholic extractive not less than 8 percent.; alcoholic solution bright green in color. Ash not exceeding 15 percent.

Cantharis.—From 15 to 25 mm. in length, 5 to 8 mm. in breadth, oblong, somewhat compressed above; of a brilliant green or bluish-green, metallic luster, changing in different parts, especially beneath, to a golden-green; head triangular, separated into two lateral lobes by a faint median line; mandibles stout and partly concealed; antennæ filiform, of 11 conical joints, the upper ones being black; eyes comparatively small; prothorax angulate; legs with five tarsal joints; wings membraneous and brownish; elytra or wing sheaths each with 2 parallel lines and finely wrinkled; odor strong, disagreeable; taste slight, afterwards acrid. Powder: Grayish-brown, with shining green particles and a number of long, pointed, 1-celled hairs about 0.5 mm. in length and 0.002 mm. in width. Moisture not more than 10 percent. Ash not exceeding 9 percent.

Capsicum.—The fruit may include not more than 2 percent. of stems, calyxes and other foreign matter. Oblong-conical, from 8 to 20 mm. in length and from 2 to 15 mm. in diameter; pericarp brownish-red or orange, shining, membraneous and translucent; 2- or 3-locular, united below, and containing 6 to 17 flat, reniform, yellowish seeds attached to the placenta or frequently separated from it; calyx light greenish-brown, inferior, inconspicuous, 5-toothed, usually attached to a long, straight peduncle; odor characteristic; sternutatory; taste intensely pungent. Powder: Yellowish-brown; mounts made with hydrated chloral T. S. and examined under the microscope show yellowish-red oil globules; stone cells of two kinds, those of endocarp being more or less elongated, walls yellowish, uniformly and moderately thickened, wavy in outline, porous and slightly lignified, those of the seed coat being yellowish, irregularly and strongly thickened, wavy in outline and strongly lignified. Non-volatile ether-extract not less than 15 percent. Total ash not exceeding 7 percent. Ash insoluble in hydrochloric acid, not exceeding 1 percent.

Cardamomi Semen.—The dried seeds of Elettaria Cardamomum White et Maton (Fam. Zingiberaceæ), which should be kept in the capsules until wanted for use. Mostly agglutinated in groups of from 2 to 7, the individual seeds, oblong-ovoid in outline, 3- or irregularly 4-sided, convex on the dorsal surface, strongly longitudinally grooved on one side, from 3 to 4 mm. in length; externally reddish-gray-brown, coarsely tubercled, and with more or less adhering portions of the membraneous aril, moderately hard but easily crushed; in section showing a thin reddish-brown seed coat, a large white perisperm and a central greenish endosperm enclosing a small straight embryo; odor aromatic; taste aromatic, pungent. Capsules broadly or narrowly ellipsoidal, occasionally ovoid, more or less triangular in transverse section, from 10 to 20 mm. in length; externally usually of a pale buff color or whitish or greenish-brown; longitudinally striate; 3-locular; pericarp thin; leathery, and nearly tasteless, enclosing from 10 to 20 seeds. Powder: Greenish-brown; consisting chiefly of coarse, angular fragments of cells of the reserve layers and seed-coat; cells of endosperm and perisperm filled with compound starch grains, the individual grains from 0.001 to 0.004 mm. in diameter; fragments of seed-coat with dark brown stone cells, which are

polygonal in surface view and about 0.020 mm. in diameter; in mounts made with hydrated chloral T. S. single prisms or crystals in rosette aggregates may separate in the cells of the endosperm and perisperm; fragments of spiral tracheæ with accompanying slightly lignified bast-fibers, relatively few. Ash not exceeding 8 percent.

Carum.—Mericarps usually separated, crescent-shaped, from 3 to 7 mm. in length, about 1.5 mm. in diameter; externally dark brown with 5 yellowish filiform ribs; in transverse section nearly equilaterally pentagonal, the commissural surface with two vittæ, the dorsal surface with a vitta between each of the primary ribs; oily endosperm large, enclosing a small embryo; odor and taste agreeably aromatic. Under the microscope transverse sections show an epidermal layer of slightly tangentially elongated cells with thick outer walls; a layer of several rows of tangentially elongated parenchyma cells, frequently more or less collapsed; a single, large, elliptical, brown, vitta or oil-tube between each of the ribs and surrounded by small epithelial or secretion cells; in each of the ribs a single fibro-vascular bundle surrounded by a layer of thick-walled sclerenchymatous fibers; inner epidermis of broadly elongated cells with very thin side-walls being very frequently broken and closely coherent with the more or less brownish, collapsed cells of the seed-coat; commissural surface with 2 large vittæ and at the middle portion 2 large transverse hollow spaces formed by the separation of the tissues of the seed-coat on one side and the pericarp on the other, otherwise the cells resemble those on the dorsal surface; endosperm large, cells polygonal with thick walls and containing a fixed oil and aleurone grains, the latter not infrequently containing a small rosette aggregate or prism of calcium oxalate. Powder: Yellowish-brown, mostly of irregular, angular fragments; cells of endosperm with aleurone grains each usually containing a rosette aggregate of calcium oxalate about 0.001 mm. in diameter; fragments with light yellow vittæ, together with nearly isodiametric or polygonal, yellowish-brown, inner epidermal cells of pericarp; fragments with tracheæ and sclerenchymatous fibers, the latter about 0.010 mm. in width, slightly lignified and with numerous oblique pores. Ash not exceeding 8 percent.

Caryophyllus.—The dried flower-bud of Eugenia aromatica (Linné) O. Kuntze, (Jambosa Caryophyllus) (Sprengel) Niedenzu, (Fam. Myrtaceæ), with not more than 5 percent. of the peduncles, stems and other foreign matter. From 10 to 17.5 mm. in length, of a dark brown or brownish-black color, consisting of a stem-like, solid, inferior ovary, obscurely four-angled or somewhat compressed, terminated by four calyx teeth, and surmounted by a nearly globular head, consisting of four petals, which enclose numerous curved stamens and one style; odor strongly aromatic; taste pungent and aromatic, followed by slight numbness. On pressure Clove emits a volatile oil. Stems either separate or attached to the flower-buds; sub-cylindrical or four-angled, attaining a length of 25 mm., a diameter of 4 mm.; either simple or branching, distinctly jointed and less aromatic than the flower-buds. Powder: Varying from dark brown to reddish-brown; consisting chiefly of cellular fragments showing the large oil reservoirs, spiral tracheæ and a few, somewhat thick-walled, slightly lignified, spindle-shaped bast-fibers; calcium oxalate in rosette aggregates, from 0.010 to 0.015 mm. in diameter; pollen grains numerous, tetrahedral, somewhat ellipsoidal, from 0.015

to 0.020 mm. in diameter. The presence of stems in the powder is shown by stone cells of irregular, polygonal shape, about 0.070 mm. in diameter, with thick porous walls and large lumina, the latter frequently filled with a yellowish-brown amorphous substance. Volatile ether-extract not less than 10 percent. Total ash not exceeding 8 percent. Ash insoluble in hydrochloric acid not exceeding 0.5 percent.

Chondrus.—The dried plant of Chondrus crispus (Linné) Stackhouse and Gigartina mamillosa (Goodenough et Woodward) J. Agardh (Fam. Gigartinaceæ). Entire plants more or less matted together, consisting of a slender stalk from which arises a series of dichotomously branching, more or less flattened segments, emarginate or deeply cleft at the tips; 5 to 15 cm. in length, segments 1 to 10 mm. in width; yellowish-white, translucent, frequently coated with a calareous organic deposit which effervesces with hydrochloric acid; sometimes with fruit bodies or sporangia embedded near the apex of the segments in C. crispus or with sporangia borne on short, tuberculated projections or stalks, more or less scattered over the upper portion of the segments in G. mamillosa, somewhat cartilaginous; odor slight; taste mucilaginous, saline. Boil one part of Chondrus for about ten minutes with 30 parts of water and replace the water lost by evaporation; the solutions should form a thick jelly upon cooling. When softened in cold water Chondrus should become gelatinous, and transparent, the thallus remaining nearly smooth and uniform and not swollen except slightly at the tips; a solution made by boiling 0.300 Gm. in 100 Cc. of water and filtering gives no precipitate on the addition of tannic acid T. S. (gelatin), and does not give a blue color when cold, upon the addition of iodine T. S. (starch).

Cimicifuga.—The drug may include not more than 2 percent. of stems and foreign matter. Rhizome horizontal, more or less branching, from 2 to 12 cm. in length, from 1 to 2.5 cm. in thickness; externally dark brown, slightly annulate from circular scars of bud-scale leaves, the upper surface with numerous stout, erect or somewhat curved branches terminated by deep cup-shaped scars each of which usually shows a distinct radiate structure; interior and lateral portions with numerous root-scars and a few short roots; fracture horny; internally whitish and mealy or dark brown and waxy, bark thin, wood distinctly radiate and of about the same thickness as the pith; odor slight; taste bitter and acrid. Roots somewhat cylindrical or obtusely quadrangular, 1 to 3 mm. in thickness, externally dark brown, longitudinally wrinkled, fracture short; internally, bark dark brown, wood yellowish, 4- to 6-rayed. Under the microscope sections of the rhizome show a yellowish-brown suberized epidermis, a cortex made up of about 30 layers of starch-bearing parenchyma cells; fibro-vascular bundles, collateral, the xylem consisting of tracheæ, with bordered pores, and resembling tracheids in that the ends are rather acute; wood-fibers numerous, thin-walled, strongly lignified and with simple, oblique pores; the bundles separated by starch-bearing parenchyma strands from 5 to 30 cells wide; pith cells numerous, resembling those of the cortex. Under the microscope sections of the roots show a hairy epidermis, which becomes suberized in older roots; the cortex shows about 12 rows of starch-bearing parenchyma cells; endodermis distinct; fibro-vascular bundles 4 to 6, showing in older roots as separate collateral bundles. Powder: Light to dark brown; starch grains numerous, single or compound, the individual grains spherical or more or less polygonal, each with a somewhat central cleft, from

0.003 to 0.015 mm. in diameter; fragments showing tracheæ with bordered pores and lignified wood-fibers; irregular, yellowish-brown fragments of suberized epidermis made up of more or less tabular cells, sometimes elongated and considerably thickened. Ash not exceeding 10 percent.

Cinchona.—Added to the former description: Externally the bark usually shows patches of foliaceous lichens with their small, brownish-black apothecia. Powder: Reddish-brown; bast-fibers spindle-shaped, yellowish, 0.300 to 1.350 mm. in length, with thick, strongly lignified, lamellated walls having slit-like, oblique pores; starch grains single, 2- to 5-compound, the individual grains spherical or plano-convex and from 0.003 to 0.015 mm. in diameter; sphenoidal micro-crystals of calcium oxalate numerous. Heat 1 Gm. of powdered Cinchona in a dry test-tube; a tarry distillate should form, having a purplish-red color and a somewhat granular appearance.

Cinchona Rubra.—In quills or curved pieces of variable length, bark from 2 to 4 mm. in thickness; or in small broken fragments or in transversely curved pieces from 3 to 7 mm. in thickness; externally gray or grayish-brown, more or less rough from corky protuberances, sometimes with transverse fissures, rarely numerous or much intersected, and having their sides sloping and with occasional patches of foliaceous lichens; inner surface reddish- or orange-brown, distinctly striate; fracture short and granular in the outer bark, shortly and rather coarsely splintery in the inner bark; slightly odorous; taste very bitter and astringent. Powder: Light brown; bast-fibers and sphenoidal micro-crystals of calcium oxalate resembling those in Cinchona; starch grains resembling those of Cinchona, relatively few, from 0.003 to 0.010 mm. in diameter. Heat 1 Gm. of powdered Red Cinchona in a dry test-tube; a tarry distillate should form, having a bright red color.

Cinnamomum Saigonicum.—In quills attaining a length of 30 cm. and from 3 to 30 mm. in diameter; the bark from 0.5 to 3 mm. in thickness; outer surface light brown to dark purplish-brown with grayish patches of foliaceous lichens, numerous bud-scars, finely wrinkled, especially the bark of younger twigs, otherwise more or less rough from corky patches surrounding the lenticels; inner surface reddish-brown to dark brown, granular, and slightly striate; fracture short; inner bark porous, owing to the presence of large oil cells; and separated by a continuous layer of stone cells from the outer bark. Odor aromatic; taste sweetish, aromatic and pungent. Under the microscope sections of the older bark show a thin layer of more or less lignified cork cells; a narrow layer of starch-bearing parenchyma with scattered stone cells; a nearly continuous zone, several layers wide, of stone cells, among which should be small groups of bast-fibers with thickened and slightly lignified walls; a wide inner bark with medullary rays 1 to 3 cells in width, isolated bast-fibers, mucilage cells, oil cells and parenchyma, the cells of the latter either filled with starch grains or containing very small raphides of calcium oxalate; the lumina of parenchyma cells, stone cells and bast-fibers frequently filled with an amorphous, reddish-brown substance, which should be for the most part insoluble in the ordinary reagents. In the bark of young twigs there should be an epidermal layer with a thick, yellowish cuticle, fewer stone cells in the zone associated with bast-fibers, and the inner bark should be narrower and with fewer secretion cells than in the older bark. Powder: Yellow-

ish- or reddish-brown; starch grains numerous, single or compound, the individual grains being somewhat ellipsoidal or polygonal and from 0.003 to 0.020 mm. in diameter; fragments, with colorless stone cells rather prominent, the cells being very irregular in shape and the lumina containing either air or a reddish-brown amorphous substance; bast-fibers from 0.300 to 1.500 mm. in length and usually in groups of from 2 to 20, with very thick and scarcely lignified walls; numerous cellular, reddish-brown fragments in which the oil cells are not readily distinguishable. Volatile ether-extract not less than 2 percent. Total ash not exceeding 6 percent. Ash insoluble in diluted hydrochloric acid not exceeding 2 percent.

Cinnamomum Zeylanicum.—The dried bark of cultivated trees of Cinnamomum zeylanicum Breyne (Fam. Lauraceæ) with not more than 3 percent. of the outer bark. In closely rolled double quills, composed of from 7 to 12 thin layers of separate pieces of bark, from 30 to 50 cm. in length and from 8 to 13 mm. in diameter; the bark attaining a thickness of 1 mm.; outer surface pale yellowish-brown, smooth, longitudinally striate with narrow yellowish groups of bast-fibers, and showing circular or irregular brownish patches, occasionally with perforations marking the nodes; inner surface light brown, with faint, longitudinal striations; fracture short with projecting bast-fibers; odor agreeably aromatic; taste sweetish and warmly aromatic. Under the microscope sections usually show no cork but an almost continuous outer layer of stone cells, among which are small groups of bast-fibers resembling those found in Saigon Cinnamon; in the inner bark occur numerous bast-fibers singly or in small groups, medullary rays 1 to 2 cells in width, usually with raphides of calcium oxalate; parenchyma with either reddish-brown contents or more or less filled with starch grains; scattered throughout the parenchyma occur oil-secretion cells and mucilage cells. Powder: Light brown or yellowish-brown; starch grains numerous, varying from spherical to polygonal, from 0.003 to 0.020 mm. in diameter, frequently in small aggregates; bast-fibers from 0.300 to 0.800 mm. in length, usually single, spindle-shaped with attenuated ends, the walls being very thick and but slightly lignified; colorless stone cells resembling those of Saigon Cinnamon; numerous cellular fragments with yellowish-brown walls or contents; cork cells few or none; calcium oxalate in raphides from 0.005 to 0.008 mm. in length. Volatile ether-extract not less than 0.5 percent. Total ash not exceeding 6 percent. Ash insoluble in diluted hydrochloric acid, not exceeding 2 percent.

Coccus.—The dried female insect enclosing her young larvæ, Coccus Cacti Linné (Fam. Coccidæ). Somewhat ovate in outline, convex above, concave beneath, from 3.5 to 5 mm. in length, consisting of from 9 to 12 segments; externally grayish-purple, or grayish; in the shell-like, somewhat horny abdomen lie numerous larvæ less than 1 mm. in size; the mature larvæ with antennæ consisting of eight parts, 3 pairs of legs, the lower being with 6 to 8 segments, and a characteristic beak or rostrum composed of 4 thread-like parts which pair off into two coils. Cochineal is easily pulverizable and yields a dark red powder; with a characteristic odor and slightly bitter taste. When masticated it colors the saliva red, due to the coloring principle, carminic acid, which is soluble in water, alcohol, or alkalies, and slightly soluble in ether, but insoluble in fixed and volatile oils. Alkalies should change the color of solutions of Cochineal to purple, while acids

should change the color to reddish-yellow. When macerated in water no insoluble powder should separate. Ash not exceeding 6 percent.

Colchici Cormus.—Usually in reniform transverse, or in ovate longitudinal slices; from 2 to 5 mm. in thickness; flat surfaces whitish, slightly roughened, and of a crystalline appearance under the hand lens; epidermal surface thin, light brown and finely wrinkled; fracture short and mealy, odor slight; taste bitter and acrid. Powder: Light brown or grayish-brown; starch grains numerous, single or 2- to 6- compound, the individual grains varying from spherical or ovoid to polygonal, and marked with a triangular or star-shaped, central cleft from 0.003 to 0.030 mm. in diameter, tracheæ few and with spiral or scalariform thickenings; occasional fragments of epidermal cells with thin, reddish-brown walls.

Colchici Semen.—The seeds should be dried; ovoid or irregularly globular, more or less pointed at the hilum, from 2 to 3 mm. in diameter; when fresh, several seeds cohering; externally dark brown, finely pitted; tough and of almost bony hardness; internally whitish or light brown; nearly inodorous; taste slightly bitter and somewhat acrid. Under the microscope transverse sections show a seed-coat of a few, more or less collapsed cells with thin reddish-brown walls; the endosperm, making up most of the seed, should consist of cells with rather thick, porous walls; and the lumina containing oil globules and aleurone grains, the latter being from 0.003 to 0.015 mm. in diameter; the embryo is small, the beaked portion, or caruncle, containing numerous, somewhat ovoid, ellipsoidal or polygonal starch grains, from 0.005 to 0.016 mm. in diameter. Ash not exceeding 8 percent.

Colocynthis.—The dried pulp of the fruit of Citrullus Colocynthis Schrader (Fam. Cucurbitaceæ), with not more than 5 percent. of seeds, nor more than 2 percent. of epicarp. Nearly globular, whole fruits from 4 to 7 cm. in diameter, usually more or less crushed and in broken pieces, with occasional patches of the nearly smooth epicarp; yellowish-white or brownish; light, spongy; separable longitudinally when entire into three carpels, each containing near the outer surface, the ovoid, compressed, yellowish seeds; odor slight; taste intensely bitter. Powder: In the preparation of the powder the fruit should be deprived of its seeds so that the finished product should contain not more than 5 percent. of seeds; yellowish-white or buff, consisting chiefly of fragments of parenchyma cells and an occasional fragment with tracheæ; very few lignified tissues of the seed-coat, showing the characteristic stone cells which are nearly isodiametric, irregular, with either straight or undulate walls that are strongly lignified and possess simple pores; globules of fixed oil and aleurone grains very few. The petroleum benzin extract from powdered Colocynth should yield not more than 2 percent. of fixed oil. Ash not exceeding 15 percent.

Condurango.—The dried bark of Marsdenia Condurango Reichenbach filius, (Fam. Asclepiadaceæ). In single quills or transversely curved pieces, usually from 4 to 13.5 cm. in length, bark from 1 to 6 mm. in thickness; outer surface light grayish-brown to dark brown, nearly smooth and with numerous lenticels, or more or less scaly and considerably roughened, the scales soft, occasionally with brownish-black apothecia of a fungus; inner surface grayish-white or light brown, longitudinally striate; fracture short and granular or short-fibrous; odor slightly aromatic, especially marked in the fresh drug; taste bitter and aromatic. Under

the microscope sections show a corky layer consisting of several rows of thin-walled cells, frequently with yellowish-brown contents; a layer of phelloderm of 8 to 10 rows of cells, containing either starch grains or membrane crystals of calcium oxalate, the latter in prisms from 0.010 to 0.035 mm. in length; a primary cortex of collenchyma containing chloroplasts, starch grains, or rosette aggregates of calcium oxalate from 0.015 to 0.040 mm. in diameter; a pericycle or pericambium of tangentially elongated parenchyma cells, with groups of bast-fibers and laticiferous vessels in an interrupted circle; middle bark with large groups of stone cells, varying from nearly isodiametric to elongated, sometimes very irregular in form; inner bark with medullary rays 1 to 2 cells wide, numerous laticiferous cells accompanied by small groups of sieve cells, parenchyma containing either starch grains or rosette aggregates of calcium oxalate, and an occasional isolated bast-fiber or small groups of stone cells. Powder: Light yellowish-brown; consisting chiefly of fragments of stone cells and parenchyma containing calcium oxalate crystals and starch grains; stone cells chiefly in large groups, the individual cells being more or less irregular in shape with very thick, porous walls, the lumina being usually filled with air; calcium oxalate chiefly in rosette aggregates, occasionally in single prisms, mostly from 0.015 to 0.020 mm. in diameter; starch grains mostly single, frequently 2- to 4-compound, the individual grains being from 0.003 to 0.015 mm. in diameter; bast-fibers non-lignified, very long and from 0.010 to 0.035 mm. in width; fragments of thin-walled latex tubes from 0.015 to 0.025 mm. in diameter and filled with a granular substance; fragments of cork grayish- or light yellowish-brown. Macerate 1 Gm. of the powdered bark in 5 Cc. of cold water, filter and heat the filtrate in a test-tube; it should become very cloudy but on cooling assumes its original transparency. Ash not exceeding 12 percent.

Convallaria.—Rhizome horizontal, elongated, usually branched, cylindrical, variable in length, from 1 to 3 mm. in diameter; externally yellowish-white or pale-brown, with a few circular stem-scars; from the under and side portions at the nodes usually arise from 3 to 5 thin, tortuous, dark brown, branching roots; fracture short or fibrous; internally whitish; odor faint; taste sweetish, becoming bitter and acrid. Under the microscope sections of the rhizome show an epidermal layer with a thick outer layer of cutin; a hypodermal layer of a single row of collenchyma; a cortex made up of about 20 rows of parenchyma cells some of which contain starch and raphides of calcium oxalate; a prominent endodermis, the radial and inner walls of which are strongly thickened and lignified; inside the endodermis is an interrupted circle of collateral fibro-vascular bundles, the woody portion of which should be in cross section the shape of the letter "V"; inside this circle of bundles is another interrupted circle of fibro-vascular bundles of the concentric type, the sieve tissue being surrounded by the xylem; the parenchyma cells of the pith are separated by large intercellular spaces. Under the microscope transverse sections of the root show a hairy epidermal layer, a hypodermis of a single row of cells, a cortex of about 6 rows of cells, some of which should contain starch, raphides and oil; the cells of the endodermal layer resemble those of the rhizome; fibro-vascular bundles mostly 5. Powder: Dark brown, tending to cake on standing, consisting chiefly of cellular fragments and a few starch grains and raphides of calcium oxalate; cells of endodermis quite long

with slightly oblique ends; the walls being considerably thickened, lignified and porous; fragments of tracheæ with spiral and scalariform thickenings or with porous walls; starch grains single or compound, mostly nearly spherical, and from 0.003 to 0.012 mm. in diameter; raphides of calcium oxalate few, from 0.020 to 0.045 mm. in length.

Coriandrum.—The fruit should contain not more than 5 percent. of other fruits, seeds and other foreign matter. Mericarps usually coherent; cremocarp nearly globular, from 3 to 5 mm. in diameter; externally light brown or rose colored; summit with 5 calyx teeth and a short stylopodium, each mericarp with 5 prominent, straight, longitudinal primary ribs and 4 indistinct, undulate, secondary ribs; mericarps easily separated, deeply concave on the inner or commissural surface and showing in transverse section 2 vittæ (oil-tubes) on the inner surface of each. Under the microscope sections show an epidermis of small cells with thick walls; a layer of several rows of thin-walled, more or less collapsed, parenchyma separated from a broad zone of strongly lignified sclerenchymatous fibers which extend as a continuous ring in the mesocarp of each of the mericarps; 2 or 3 layers of large, tangentially elongated, thin-walled, parenchyma cells, frequently with numerous, large, lysigenous, intercellular spaces; inner epidermis of large, tabular cells, the inner, yellowish walls being considerably thickened and closely coherent to the brownish cells of the seed-coat; commissural surface with 2 large elliptical vittæ, the cells of the pericarp separated from the seed-coat and forming a large elliptical cavity; endosperm distinctly reniform in outline and consisting of tabular or polygonal, thick-walled cells, containing numerous large aleurone grains each with a rosette aggregate or prism of calcium oxalate. Powder: Light brown, consisting chiefly of fragments of endosperm and lignified tissues of the pericarp; calcium oxalate crystals numerous, from 0.003 to 0.010 mm. in diameter, mostly in rosette aggregates, either isolated or in aleurone grains; sclerenchymatous fibers irregularly curved, having thick, yellowish, lignified walls and numerous simple pores; globules of fixed oil numerous; fragments of light-yellow vittæ few, associated with elongated, polygonal, epidermal cells. Volatile ether-extract not less than 0.5 percent. Ash not exceeding 7.5 percent.

Cubeba.—The dried, full grown, unripe fruits of Piper Cubeba Linné filius (Fam. Piperaceæ), with not more than 5 percent. of stems and other foreign matter. Upper portion globular, 3 to 6 mm. in diameter, with a straight, slender, stem-like portion from 5 to 7 mm. in length; pericarp externally grayish, brownish- or bluish-black; coarsely reticulate; about 0.3 mm. in thickness, easily cut, 1-locular, 1-seeded; the immature seed attached at the base of the pericarp; odor aromatic, distinct; taste strongly aromatic and pungent. Under the microscope sections show an epidermal layer of tabular cells with thickened, undulate outer walls, the contents being olive-green; 1 or 2 rows of parenchyma cells, the contents resembling those of the epidermal cells; a continuous layer of radiately elongated, thick-walled stone cells, having numerous pores; a few layers of collapsed cells near which may occur an occasional small group of bast-fibers; a middle layer of 10 rows of cells composed chiefly of parenchyma, scattered among which are numerous secretion cells containing a volatile oil and occasionally crystals in the form of short rods, the contents of the secretion cells being colored a deep crimson upon the addition of sulphuric acid; an endocarp of small, somewhat isodia-

metric or polygonal stone cells with very thick, porous walls; seed-coat of several rows of reddish-brown, tangentially elongated, more or less collapsed cells; perisperm of numerous, thin-walled parenchyma, the cells being more or less polygonal in shape and containing either small, compound starch grains, or globules of a fixed oil or occasionally a crystal of calcium oxalate. Powder: Light brown to blackish-brown, consisting of a more or less even distribution of starch-bearing cells of the perisperm, and fragments of the pericarp with stone cells; starch grains numerous, single or compound, from 0.002 to 0.012 mm. in diameter; stone cells numerous, in palisade-like groups, in surface view rounded or polygonal with rather prominent dark lumina and yellowish porous walls; secretion cells with a yellowish, oily content becoming reddish on the addition of sulphuric acid; fragments of stalk few, with spiral tracheæ and groups of sclerenchymatic fibers from 0.050 to 1.000 mm. in length with blunt, rounded, or very much attenuated ends, the walls strongly lignified and with numerous oblique pores. Volatile ether-extract not less than 10 percent. Total ash not exceeding 8 percent.

Digitalis.—The dried leaves of Digitalis purpurea Linné (Fam. Scrophulariaceæ) with not more than 2 percent. of stems, flowers, and other foreign matter; leaves when entire attaining a length of 30 cm. and a breadth of 15 cm., ovate to oval, abruptly contracted into winged petioles, the latter from 5 to 10 cm. in length, or, in the smaller leaves, nearly absent; margin crenate, irregular; the commercial article usually more or less crumpled and broken, thin, dull, pale green or gray and densely pubescent on the lower surfaces; upper surfaces wrinkled, sparsely hairy; the venation conspicuously reticulated; the midribs and principal veins broad and flat, often purplish, the lower veins continued into the wings of the petioles; odor slight, characteristic; taste strongly bitter. Powder: Dark green, with numerous fragments of non-glandular hairs consisting of from 2 to 8 cells (usually 2 to 5 cells), varying in length from 0.145 to 0.435 mm., some of the cells being frequently collapsed; glandular hairs few, small, with a 1- or 2-celled stalk and a 1- or 2-celled glandular head; numerous irregular fragments of lumina showing stomata and occasional water-pores and elongated fragments of veins and petioles showing fibro-vascular tissues. Ash not exceeding 10 percent.

Ergota.—The carefully dried sclerotium of Claviceps purpurea (Fries) Tulasne (Fam. Hypocreaceæ), replacing the grain of rye, Secale cereale Linné (Fam. Gramineæ), with not more than 5 percent. of harmless seeds, fruits and other foreign matter. Cylindraceous, obscurely three-angled, tapering towards both ends, obtuse, somewhat curved, from 1 to 4.5 cm. in length and 3 to 5 mm. in thickness; externally purplish-black, or brownish-black, longitudinally furrowed; fracture short, pinkish or reddish-white, sometimes whitish; odor peculiar, disagreeable; taste disagreeable, bitter. Pour hot water on bruised Ergot; no ammoniacal or rancid odor should be developed. Powder: Grayish-brown, consisting chiefly of whitish fragments composed of false parenchyma of compacted hyphæ and a few purplish colored fragments of the outer layer of the sclerotium; mounts made in hydrated chloral T. S. or in sulphuric acid show the separation of numerous globules of a fixed oil and many of the fragments should be colored yellowish, reddish or rose-purple. Ash not exceeding 5 percent.

Ergot should be dried at a temperature not exceeding 70° C. The drug deteriorates with age if improperly stored. It should be kept in tightly closed containers protected from the light and to which a few drops of chloroform should be added from time to time to prevent attack by insects. The powdered drug should not be kept longer than one year.

Eriodictyon.—The leaves may include not more than 5 percent. of stems or other foreign matter. Usually in fragments; when entire, laminae lanceolate, 5 to 15 cm. in length, 1 to 3 cm. in breadth; summits acute; bases slightly tapering into a short petiole; margins irregularly serrate or crenate-dentate; upper surfaces yellowish-brown, covered with a more or less shiny resin; under surfaces grayish or yellowish-white, conspicuously reticulate with greenish-yellow veins; minutely tomentose between the reticulations; coriaceous, brittle; odor aromatic; taste balsamic, bitter, becoming sweetish. Under the microscope transverse sections of the laminae of Eriodictyon show upon the upper surface large epidermal cells, the outer walls being very uneven owing to indentations which appear as striations in surface view; glandular hairs numerous, with short 1-celled stalks and 6- to 8-celled glandular heads; palisade cells very narrow, from 2 to 6 rows deep containing numerous chloroplastids; cells of dorsal-pneumatic tissue (loose mesophyll) very few; fibro-vascular tissues not strongly developed except in the mid-rib and more prominent veins; numerous, 1-celled, much twisted, thick-walled, non-glandular hairs on the lower surface between the veins. Under the microscope sections of the stems show the epidermis usually replaced by strongly lignified cork; cortex of from 10 to 20 rows of more or less rounded cells; bast-fibers deep-seated and with thick, more or less strongly lignified walls, occurring in small groups forming a more or less interrupted circle; sieve tissues in a narrow zone; wood wedges consisting of tracheæ with spiral thickenings, simple or bordered pores and numerous, strongly lignified wood-fibers, separated by medullary rays 1-cell in width; pith very large, the walls of the cells being strongly lignified and with numerous simple pores.

Eucalyptus.—The leaves may include not more than 3 percent. of the stems, fruits, and other foreign matter. Laminae lanceolately scythe-shaped, from 8 to 30 cm. in length, from 2 to 7.5 cm. in breadth; summits when present acute or acuminate; bases unequal, obtuse or more or less rounded and connected with twisted petioles from 5 to 35 mm. in length; margins slightly uneven, revolute; coriaceous; both surfaces varying from pale yellowish-green to grayish-green and more or less glaucous, glabrous, glandular-punctate and with numerous, small circular, brown dots of cork; veins of the first order anastomosing with each other and forming a line nearly parallel with the margin; odor slightly aromatic; taste aromatic, bitter, and cooling. Under the microscope sections show the upper and lower surfaces with nearly similar cells, the outer walls being strongly cuticularized; stomata occur on both surfaces; a region of palisade cells made up of from 3 to 4 rows of cells occurring beneath each surface; among the palisade cells occur large oil-secretion reservoirs, with a yellowish or orange colored oily content; calcium oxalate crystals in cells of the loose mesophyll in the form of rosette aggregates or monoclinic prisms varying from 0.015 to 0.025 mm. in diameter. At the periphery of the fibro-vascular

bundles of the mid-rib and petiole occurs a more or less interrupted circle of small groups of slightly lignified bast-fibers.

Euonymus.—The bark may include not more than 3 percent. of wood and other foreign matter. Usually in transversely curved pieces, occasionally in single quills 2 to 7 cm. in length; bark 1 to 2.5 mm. in thickness; very light in weight; outer surface grayish or light brown, somewhat wrinkled, occasionally transversely fissured from the lenticels and with scale-patches of soft cork; inner surface grayish-white, longitudinally striate and somewhat porous; fracture short with silky, projecting, bast-fibers; odor distinct; taste bitter and acrid. Powder: Light brown; starch grains numerous, nearly spherical, 0.003 to 0.012 mm. in diameter; fragments of cork with nearly colorless thin walls; secretion cells with yellowish or brownish amorphous contents; bast-fibers very long, with thin, non-lignified walls possessing numerous small, more or less oblique pores; numerous fragments of starch-bearing parenchyma; calcium oxalate in rosette aggregates from 0.015 to 0.035 mm. in diameter, the amount in different specimens showing some variation.

Fœniculum.—The dried ripe fruits of cultivated varieties of Fœniculum vulgare Miller (Fam. Umbelliferæ), with not more than 2 percent. of harmless foreign matter. Mericarps usually separate, each being broadly elliptical, more or less curved, from 4 to 10 mm. in length, from 1 to 3.5 mm. in breadth, some having a slender stalk from 2 to 10 mm. in length; dorsal surface convex, yellowish-green to grayish-brown, with three prominent, longitudinal primary ribs and at the summit a short, conical stylopodium; commissural surface with three narrow, light brown, longitudinal areas separated by two dark brown or brownish-black areas containing the vittæ or oil-tubes; odor and taste aromatic and distinct. Under the microscope transverse sections of Fennel show a pentagonal mericarp, 4 of the edges being nearly equal and slightly concaved, the other or commissural surface being much longer and more or less undulate; cells of the seed-coat closely united with those of the pericarp, giving the section two very distinct areas, the inner and larger portion more or less rounded-pentagonal and somewhat reniform, composed of polygonal cells, filled with aleurone grains containing rosette aggregates of calcium oxalate, and a thin protoplasmic layer enclosing a fixed oil; the outer or pericarp layer distinguished by large elliptical vittæ with thick, brown walls, occurring singly and alternating with the primary ribs, and two vittæ on the dorsal surface, making usually six vittæ in all, there sometimes being, however, one or two vittæ additional; in the central portion of each of the ribs occurs a nearly circular, fibro-vascular bundle with a few tracheæ and numerous, thin-walled, strongly lignified, sclerenchymatous fibers. Powder: Yellowish-brown consisting or irregular, angular fragments; tissues of endosperm, colorless, the cells filled with aleurone grains each containing a rosette aggregate of calcium oxalate, about 0.002 mm. in diameter; fragments containing yellowish-brown vittæ, from 0.100 to 0.200 mm. in width; sclerenchymatous fibers few, strongly lignified and with numerous, oblique, simple pores; parenchyma cells with more or less thick walls and simple pores and occasionally reticulately thickened; tracheæ few and either spiral or annular; in mounts made with hydrated chloral T. S. numerous globules of a fixed oil separate. Ash not exceeding 10 percent.

Frangula.—The dried bark of Rhamnus Frangula Linné (Fam. Rhamnaceæ). In quills varying in length, frequently flattened or crushed; from 0.5 to 1 mm. in thickness; outer surface grayish-brown or purplish-black, with numerous, prominent, lighter colored, transverse lenticels and occasional patches of foliaceous lichens bearing small, blackish apothecia; inner surface smooth, dark brown with occasional purplish blotches, longitudinally striate, becoming red when moistened with solutions of the alkalies; fracture short, slightly fibrous in the inner layer; odor distinct; taste slightly bitter. Under the microscope transverse sections show a distinctly undulate, corky layer, composed of about 12 rows of reddish-brown cells; parenchyma cells of the primary cortex with numerous rosette aggregates of calcium oxalate from 0.010 to 0.025 mm. in diameter; inner bark with bast-fibers in narrow, interrupted rows, the groups of fibers being separated radially by the medullary rays; bast-fibers with thick, strongly lignified, yellowish walls and narrow lumina and each group surrounded by a layer of crystal-fibers, the prismatic crystals of calcium oxalate, varying from 0.007 to 0.015 mm. in diameter; medullary rays 1 to 2 cells in width, occasionally 3; cells of the parenchyma and medullary rays with numerous starch grains about 0.003 mm. in diameter. Powder: Yellowish-brown; stone cells absent (distinguishing it from powder of Rhamnus Purshiana). Add 0.100 Gm. of powdered Frangula to 10 Cc. of hot water, shake the mixture occasionally until cold and filter it. On the addition of a few drops of ammonia water, the filtrate should be colored a deep red. Macerate 0.100 Gm. of powdered Frangula with 10 drops of alcohol; add 10 Cc. of water, boil the mixture and filter it when cold. Shake the filtrate with 10 Cc. of ether, separate the yellow, ethereal solution, and shake 3 Cc. of this ethereal liquid with 3 Cc. of ammonia water; the separated ammoniacal solution, on diluting with 20 Cc. of water, should still possess a distinct cherry-red color. Ash not exceeding 6 percent.

Galla.—An excrescence on the young twigs of Quercus infectoria Olivier and other allied species of Quercus (Fam. Fagaceæ), induced by the punctures on the leaf-buds and by the deposited ova of Cynips tinctoria Hartig (Fam. Hymenoptera). Nearly globular, from 0.8 to 2.2 cm. in diameter; externally blackish-olive-green or blackish-gray, more or less tuberculated on the upper portion, the basal portion being nearly smooth and contracted into a short stalk, heavy, sinking in water excepting the smaller galls which should not be present to a greater extent than 5 percent.; fracture short-horny, internally grayish or dark brown, consisting of a central portion slightly radiating and resinous, occasionally hollow and traversed by a narrow radial canal extending to the exterior as shown by the perforation in the whole gall; odor slight; taste strongly astringent. Powder: Numerous fragments of thick-walled, starch-bearing parenchyma; starch grains numerous, more or less free in the powder and varying in shape from spherical or ellipsoidal to polygonal, and from 0.005 to 0.030 mm. in diameter; stone cells few, resembling those found in fruits and seeds, varying considerably in shape and size, from 0.025 to 0.300 mm. in length; occasional fragments with spiral or reticulate tracheæ; fragments mounted in very dilute ferric chloride T. S. should become of a deep blue or greenish-blue color. Macerate 0.5 Gm. of powdered Nutgall with 2 Cc. of alcohol for a few minutes, add 500 Cc. of water, stir the mixture well for five minutes and filter. On adding a drop of ferric chloride

T. S. to 1 Cc. of this filtrate, diluted with 10 Cc. of distilled water, a distinct blue or violet-blue color should develop.

Gambir.—A dried extract prepared from decoctions of the leaves and twigs of Ourouparia Gambir (Hunter) Baillon (Fam. Rubiaceæ). Usually in cubical or rectangular pieces; from 20 to 30 mm. in diameter; externally pale grayish-brown to reddish-brown, more or less dull and porous; friable, internally of a light brown or dull earthy color; inodorous; taste bitterish and very astringent. Upon scraping a piece of Gambir and mounting the separated fragments in hydrated chloral T. S. and examining them under the microscope, numerous acicular crystals, from 0.010 to 0.030 mm. in length, should separate at the edges of the fragments which gradually dissolve leaving a few thick-walled, non-glandular hairs which, when entire, may be 0.350 mm. in length; a few fragments of leaves may also be present showing either epidermal cells or small narrow tracheæ with spiral or annular markings; a few starch grains either single or compound, of variable shape and from 0.005 to 0.015 mm. in diameter; a number of bacteria may also be present. Macerate 1 Gm. of Gambir with 50 Cc. of water and filter. Separate portions of this filtrate should give an intense, green color with dilute ferric chloride T. S. and no precipitate with copper sulphate T. S. Not less than 65 percent. of Gambir should be soluble in water and not less than 60 percent. should be soluble in alcohol. Ash changed from "not more than 5 percent." to "not exceeding 9 percent."

Gelsemium.—Rhizome, cylindrical, usually in pieces from 3 to 20 cm. in length, and from 3 to 30 mm. in diameter; externally light yellowish-brown, longitudinally wrinkled, with purplish-brown, longitudinal lines and transverse fissures; the upper surface with a few stem-scars, the under and side portions with numerous roots and root-scars; fracture tough, splintery; internally light brown or pale yellow, bark thin, wood distinctly radiate, excentral, pith disintegrated; odor slight; taste bitter. Roots, light brown; fracture one-half transverse, the other oblique or splintery. Under the microscope sections of the rhizome show a strong development of cork, the walls being grayish or yellowish-brown and more or less lignified; a cortex made up chiefly of parenchyma containing starch and having in the outer portion small scattered groups of stone cells or sclerenchymatous fibers, and in the inner portion, in the region of the medullary ray cells, prisms of calcium oxalate; woody portion made up of broad wedges consisting of large tracheæ and wood-fibers separated by starch-bearing medullary rays, the innermost cells, or those nearer the pith, being strongly lignified, while the outermost layers, or those nearer the cortex, are non-lignified and may contain prisms of calcium oxalate; an internal phloem or sieve, the cells forming distinct, more or less rounded groups, the latter being partly surrounded by a thin-walled, starch-bearing pith. Powder: Dark yellow, tracheæ with bordered pores, numerous and conspicuous, spiral tracheæ few; bast-fibers and tracheids long and narrow, strongly lignified; starch grains spherical, from 0.004 to 0.008 mm. in diameter; calcium oxalate in monoclinic prisms from 0.015 to 0.030 mm. in length; occasional groups of stone cells or sclerenchymatous fibers, the walls being very thick, porous and strongly lignified.

Gentiana.—In nearly cylindrical, sometimes branching pieces, of variable length, from 5 to 35 mm. in thickness; externally yellowish-brown, the rhizome

portion annulate, the roots longitudinally wrinkled; fracture short and uneven when dry, but tough and flexible when damp; internally yellowish-brown, the bark from 0.5 to 2 mm. in thickness, separated from the somewhat spongy, woody portion by a dark brown cambium zone; odor strong, characteristic; taste slightly sweetish, then strongly and persistently bitter. Powder: Light brown or yellowish-brown, consisting chiefly of parenchymatous cells with fragments of scalariform or reticulate tracheæ; starch grains few or none. Stone cells and sclerenchymatous fibers are absent (absence of endocarp of Olea Europea Linné). Ash not exceeding 6 percent.

Glycyrrhiza.—Botanical sources now given as Glycyrrhiza glabra Linné var. typica Regel et Herder, or Glycyrrhiza glabra Linné var. glandulifera Regel et Herder. Spanish Licorice: (also known as Italian, Levant, Turkish or Arabian Licorice). Nearly cylindrical, upper portion more or less knotty, usually in pieces from 14 to 20 cm. or more in length, and from 5 to 20 mm. in thickness; externally yellowish-brown or dark brown, longitudinally wrinkled, the thinner rhizomes being often with prominent alternate buds, the thicker rhizomes with distinct corky patches; fracture coarsely fibrous; internally lemon-yellow, radiate, bark 1 to 3 mm. in thickness; wood porous, in narrow wedges, rhizome with small pith; odor distinct; taste sweetish and slightly acrid. Under the microscope transverse sections of pieces of the older rhizome of Spanish Licorice show a periderm of numerous layers of yellowish-brown cork cells; a phellogen and one or more rows of cells of the phelloderm, the cells showing a tendency to collenchymatic thickenings and with occasional monoclinic prisms of calcium oxalate; a middle bark of starch-bearing parenchyma, and whitish groups of bast-fibers surrounded with crystal-fibers; inner bark with a very characteristic radial arrangement of phloem and medullary rays, the phloem consisting of wedges of small groups of bast-fibers and parenchyma, separated by an almost continuous, obliterated sieve tissue, the cells of the latter being very irregular in outline and with thick, highly refracting walls, medullary rays 1 to 8 cells wide; wood characterized by broad wedges consisting of large tracheæ with yellowish walls, small compact groups of wood-fibers and starch-bearing parenchyma alternating with the broad medullary rays; pith composed of parenchyma, the cells being large, more or less polygonal in outline and containing numerous starch grains, or prisms of calcium oxalate. In sections of roots the pith is wanting. Russian Licorice: Nearly cylindrical, somewhat tapering, sometimes split longitudinally, from 15 to 30 cm. in length, and from 1 to 5 cm. in diameter, when deprived of the outer corky layer it is externally pale lemon-yellow; fracture coarsely fibrous, internally lemon-yellow; wood radially cleft; odor distinct; taste sweetish. Under the microscope transverse sections of the rhizome and roots of Russian Licorice somewhat resemble those of Spanish Licorice but the cork cells are wanting Powder: Pale brownish-yellow (Spanish Licorice) or pale yellow (Russian Licorice), starch grains numerous mostly single and elliptical or oval, and from 0.002 to 0.020 mm. in diameter; tracheæ mostly with bordered pores; wood- and bast-fibers numerous, strongly lignified, very long, very attenuated at the ends, and about 0.010 mm. in width; crystal-fibers with monoclinic prisms of calcium oxalate, the latter from 0.010 to 0.020 mm. in diameter; occasional fragments of reddish-brown cork cells occur in Spanish Licorice, but are practically want-

ing in the Russian Licorice. Add 10 Gm. of powdered Glycyrrhiza to 100 Cc. of distilled water, allow the mixture to macerate for 15 minutes with occasional stirring and then heat it for one-half hour on a water-bath and filter the mixture and add enough water to make the filtrate measure 100 Cc.; 10 Cc. of this filtrate when evaporated and dried at 100° C. should leave a residue of not less than 0.200 Gm. Ash not exceeding 7 percent.

Granatum.—The dried bark of the stem and root of Punica Granatum Linné (Fam. Punicaceæ) with not more than 2 percent. of wood and other foreign matter. Stem Bark: Mostly in somewhat flattened or transversely curved pieces, to some extent in quills, 2 to 8 cm. in length; bark 0.5 to 3.5 mm. in thickness; outer surface yellowish to grayish-brown, with grayish patches of foliaceous lichens with their brownish-black apothecia, longitudinally wrinkled, also marked with small broadly ellipitical lenticels and with more or less abraded patches of cork; inner surface light yellow or yellowish-brown, finely striate; fracture short, smooth, inner bark yellowish-green; odor slight; taste astringent, somewhat bitter and nauseous. Root Bark: In transversely curved pieces; externally brownish-yellow to dark brown and with irregular patches of cork; internally dark yellow, the medullary rays extending nearly to the outer surface. Powder: Yellowish-brown to dark brown; calcium oxalate crystals in rosette aggregates, monoclinic prisms or crystal-fibers, the individual crystals 0.010 to 0.018 mm. in diameter; starch grains numerous, spherical, ellipsoidal bi-convex, polygonal or irregular, and single or compound, from 0.002 to 0.010 mm. in diameter; fragments of whitish cork with strongly lignified walls; stone cells mostly single, occasionally in small groups, the individual cells 0.050 to 0.180 mm. in length, the walls being very thick and strongly lamellated; occasional fragments of wood with long wood-fibers from 0.015 to 0.020 mm. in width, the walls being slightly lignified and from 0.003 to 0.008 mm. in thickness, and associated with tracheæ possessing simple and bordered pores. Mix 1 Gm. of powdered Granatum with 100 Cc. of distilled water, macerate it with occasional agitation for about one hour and filter; a light yellow filtrate should be obtained. Upon the addition of a drop of ferric chloride T. S. to 10 Cc. of this filtrate a bluish-black precipitate should be produced. Upon the addition of from 40 to 50 Cc. of lime water to another portion of 10 Cc. of the filtrate, an orange-brown flocculent precipitate should be produced. Ash not exceeding 16 percent. Granatum should not be kept longer than one year.

Grindelia.—The dried leaves and flowering tops of Grindelia camporum, Greene, or Grindelia cuneifolia Nuttall, or Grindelia squarrosa (Pursh) Dunal (Fam. Compositæ), with not more than 10 percent. of stems and other foreign matter. Stems with attached branches and terminated with resinous flower-heads; stems cylindrical, not exceeding 2 mm. in diameter, light yellow or rose colored, with alternate leaf-scars, occasionally with basal portions of leaves, occasionally more or less irregularly flexuous and coated with resin especially at the nodes; leaves usually separate and more or less broken and varying in shape when entire from oblong and lanceolate to oblanceolate-spatulate and cuneate-spatulate, 1 to 7 cm. in length, mostly sessile or amplexicaule and more or less sharply serrate or evenly spinosely toothed, pale

yellow to yellowish-green, very resinous, somewhat coriaceous and brittle; bracts of flowering branches almost entire and usually more or less spreading; heads more or less resinous, viscid, many-flowered, either conical-urceolate or depressed-urceolate, involucres 5 to 20 mm. in breadth, composed of numerous imbricated bracts with more or less recurved tips; ray florets yellow, ligulate and pistillate; disk florets yellow, tubular and perfect; pappus of 2 or 3 mostly unequal, linear awns about the length of the disk florets; disk achenes more or less ovoid or oblong, more or less compressed or triquetrous, and either bi-auriculate or broadly unidentate or with a broad truncate, corky-thickened summit; odor balsamic; taste aromatic and bitter, resinous. Powder: Yellowish-brown; consisting of numerous fibrous fragments made up of tissues of the stem, the most prominent being the tracheæ with annular and spiral thickenings or marked with simple or bordered pores, associated with numerous narrow, strongly lignified wood-fibers; pith cells more or less tabular and containing a layer of protoplasm in which are embedded numerous spheroidal granules; fragments of epidermis of leaves very characteristic and showing more or less polygonal areas containing large chloroplastids, and the large colorless, basal cells of the multicellular, glandular hairs; pollen grains spherical 0.035 mm. in diameter, spinose, and in section showing three pores.

Guaiacum.—In irregular, or in large, nearly homogeneous masses, occasionally in more or less rounded or ovoid tears, enclosing fragments of vegetable tissues; externally greenish-gray-brown, the fractured surface having a glassy lustre, the thin pieces being translucent and varying in color from yellowish to reddish-brown; odor balsamic; taste slightly acrid. Guaiac should melt at from 80° to 90° C. It is readily soluble in alcohol, ether, chloroform, creosote, and in solutions of the alkalies or of hydrated chloral T. S. It is sparingly soluble in carbon disulphide or benzene.

Guarana.—Powder: Light pinkish-brown; consisting mostly of irregular masses of parenchyma containing more or less altered starch grains; unaltered starch grains occasional, varying from spherical and polygonal to ellipsiodal and broadly ovoid, from 0.010 to 0.025 mm. in diameter; occasional fragments with narrow elongated sclerenchymatous cells, the walls being thick, yellowish and non-lignified. Add 0.001 Gm. of powdered Guarana to a slide, upon which a drop of hydrochloric acid has previously been placed, add a drop of gold chloride T. S. and allow the mixture to stand for a few minutes. Beginning at the edge of the mount, crystals of caffeine gold chloride should be separate in the form of orthorhombic plates and needles, the latter usually occurring in spheroidal aggregates and finally forming branching groups.

Humulus.—Hops may include not more than 2 percent. of stems, leaves and other foreign matter. Scales "imbricated". Color described as strong and characteristic, becoming disagreeable and valerian-like on aging. Ash not exceeding 8 percent. Hops should be dried at a temperature not exceeding 70° C. and should be kept in air-tight containers protected from the light.

Hydrastis.—The drug may include not more than 2 percent. of stems, leaves and other foreign matter. Rhizome horizontal or oblique, sub-cylindrical

and usually more or less flexuous, 1 to 5 cm. in length and 2 to 7 mm. in diameter, occasionally with stem-bases; externally yellowish or grayish-brown, marked by numerous stem scars and more or less annulate from scars of bud-scales, otherwise deeply longitudinally wrinkled, and on the under and lateral portions arise numerous long, filiform roots which are easily detached; fracture short, waxy; internally of a deep yellow color and consisting mostly of parenchyma enclosing an interrupted circle of small fibro-vascular bundles; odor distinct; taste bitter. Powder: Brownish-yellow; starch grains numerous, from 0.002 to 0.015 mm. in diameter, being mostly single, nearly spherical, and either free or in the parenchyma cells; fragments with the tissues of the fibro-vascular bundles mostly associated with starch-bearing parenchyma; tracheæ, with simple and bordered pores and occasionally spiral thickenings, and associated with short sclerenchymatous fibers possessing thin walls with simple pores; occasional fragments of tabular cork cells with reddish-brown walls.

Hyoscyamus.—The dried leaves and flowering or fruiting tops of Hyoscyamus niger Linné (Fam. Solanaceæ). Usually much wrinkled, with numerous stems and with the flowering or fruiting tops intermixed; leaves when entire attaining a length of 25 cm. and a breadth of 10 cm., ovate or ovate-oblong, very inequilateral, the lower with short petioles, the upper sessile, summits acute, margins coarsely and angularly 1- to 4-toothed or lobed, grayish-green, glandular-hairy, particularly on the lower surfaces; flowers nearly sessile with an urn-shaped unequally 5-toothed calyx and a campanulate corolla which in the fresh state is of a yellowish color; fruit a 2-locular pyxis, and enclosed in a large urn-shaped calyx with 5 acute teeth; odor heavy, distinct; taste somewhat bitter and acrid. Stems from 3 to 7 cm. in length and from 2 to 5 mm. in thickness, nearly cylindrical or somewhat compressed, longitudinally wrinkled and hairy. Powder: Grayish-green; calcium oxalate crystals usually in the form of 4- to 6-sided, isolated prisms, sometimes in twins, from 0.015 to 0.025 mm. in length, also occurring in spherical aggregates either isolated or attached to the prismatic crystals, sometimes in rosette aggregates, 0.020 mm. in diameter, and occasionally in sphenoidal micro-crystals; hairs numerous, of two kinds; the non-glandular 2 to 10 cells in length, the glandular with a 1- to many-celled head and a 1- to 4-celled stalk; fragments of epidermis with broadly elliptical stomata, 0.030 to 0.035 mm. in length and with 3 to 4 neighboring cells; fragments of tracheæ with simple or bordered pores and spiral or reticulate thickenings, also associated with libriform sclerenchymatous fibers having thin, porous walls and showing little or no lignification. The presence of the leaves of Hyoscyamus muticus Linné in either the crude or powdered drug of Hyoscyamus may be determined by the characteristic branching non-glandular hairs occurring on both the stems and leaves of H. muticus. Ash not exceeding 30 percent.

Ipecacuanha.—Ipecac may contain not more than 10 percent. of stems. Rio Ipecac: In cylindrical pieces, curved and sharply flexuous, occasionally branched, from 3 to 15 cm. in length, and from 2.4 to 4 mm. in thickness; externally dark brown, closely annulated with thickened, incomplete rings, and usually exhibiting transverse fissures with vertical sides; fracture of bark short,

of wood tough, bark very thick, light brown, easily separable from the yellowish-white wood; odor very slight, peculiar, the dust sternutatory; taste bitter and nauseous, somewhat acrid. Stems cylindrical, attaining a lengh of 10 cm. and a thickness of 2 mm., dark brown, finely longitudinally wrinkled and with a few elliptical scars. Carthagena Ipecac: Cylindrical or slenderly fusiform, more or less tortuous, from 3 to 12 cm. in length, and from 4 to 6.5 mm. in thickness; externally grayish-brown, the annulations usually not so numerous as in Rio Ipecac, occasionally transversely fissured and with circular scars of roots; bark 2 mm. in thickness, dark brown, smooth, somewhat horny, and easily separable from the light brown wood. Stems attaining a length of 10 cm. and a thickness of from 2 to 3 mm., cylindrical, somewhat zigzag, due to the prominent nodes with their elliptical stem-scars, grayish or dark brown and longitudinally wrinkled; bark thin. Powder: Light brown; starch grains numerous, 1- to 4- or more compound, the individual grains spherical or polygonal, from 0.003 to 0.017 mm. in diameter; calcium oxalate in raphides from 0.015 to 0.040 mm. in length, few; tracheids with bordered pores and oblique slit-likes pores. The stem bark shows a few, slightly elongated stone cells, from 0.030 to 0.045 mm. in length, with thick lignified walls and simple, branching pores. Ash not less than 1.8 percent. nor more than 4.5 percent.

Jalapa.—Fusiform, irregularly ovoid or pyriform, upper end more or less rounded, lower end slightly tapering, the large roots often incised or cut into pieces; from 4 to 15 cm. in length, from 12 to 60 mm. in diameter; externally dark brown, longitudinally wrinkled or furrowed and with numerous lenticels; hard, compact, not fibrous; when broken internally, dark brown, mealy or waxy, bark 1 to 2 mm. in thickness, outer bundles separated from outer cortical layer by a distinct brown cambium zone; odor slight but peculiar, smoky and sweetish; taste sweetish and acrid. Powder: Light brown; starch grains numerous, single or 2- to 3-compound and more or less swollen, ellipsoidal or ovoid with concentric or excentral lamellæ and radiating clefts or fissures from 0.003 to 0.035 mm. in diameter, calcium oxalate in rosette aggregates from 0.010 to 0.035 mm. in diameter; tracheæ short, wide, with simple or bordered pores; laticiferous vessels with yellowish-brown, resinous masses. Ash not exceeding 6.5 percent.

Kino.—The spontaneously dried juice. In small, angular fragments, usually considerably less than 15 mm. in diameter, varying in color from a dark reddish-brown to reddish-black, brittle; when crushed upon a slide and examined under the microscope, the angular fragments are more or less translucent with a glass-like, conchoidal surface, the thinner pieces having a yellowish-red or deep brownish-red color, the pieces often being marked by nearly parallel, curved or straight lines; inodorous; taste very astringent, when masticated it colors the saliva pinkish. Powder: Of a dark brick-red or ochre color, upon the addition of water the sharp angular fragments should assume a deep, rich red color and become more or less rounded and separate into innumerable, small, granular particles among which are included a large number of rod-shaped bacteria. Upon mounting powdered Kino in alcohol, the fragments at first assume a deep red color, then mostly dissolve, leaving a number of small, colorless granules and indistinguishable, cellular fragments.

Kino is only partly soluble in cold water, and not less than 40 percent. should be soluble in boiling water, the latter upon cooling and filtering should show a faintly acid reaction, give a dark green precipitate with ferric chloride T. S., and a reddish-violet color with alkalies. Alcoholic extractive not less than 45 percent. Moisture content not more than 12 percent. Ash not exceeding 3 percent.

Krameria.—The drug may include not more than 5 percent. of stems. The family name changed from "Krameriaceæ" to Leguminosæ. Peruvian Rhatany: It consists of a knotty, several- to many-headed crown with numerous branching roots; the latter rarely attaining a length of 50 cm. and usually less than 1 cm. in thickness, cylindrical, somewhat tapering, flexuous or wavy and very flexible, externally light reddish-brown or brownish-red, more or less marked with dark, scaly cork, especially in the upper portion, otherwise nearly smooth, somewhat longitudinally wrinkled and devoid of transverse fissures; fracture of bark slightly fibrous, of wood tough and splintery, the pinkish-brown bark less than one-third of the radius, the wood yellowish or pinkish-white and finely radiate; inodorous; wood nearly tasteless, bark astringent. Savanilla Rhatany and Para Rhatany: Roots usually separate, less flexuous and tapering than those of Peruvian Rhatany, and usually not exceeding 12 mm. in thickness; externally purplish-brown or chocolate brown and marked with numerous fissures, fracture less tough than that of Peruvian Rhatany, internally the bark and wood darker, the bark about two-fifths or more of the radius and more astringent than that of Peruvian Rhatany. Powder: Reddish-brown; starch grains, single or 2- to 4-compound, the individual grains spherical, ellipsoidal, or plano-convex and sometimes with a central, radial or star-like cleft, from 0.003 to 0.035 mm. in diameter, bast-fibers more or less wavy in outline with very much attenuated ends and with non-lignified walls; tracheæ with simple or bordered pores associated with numerous wood-fibers which are narrow spindle-shaped and with thick, porous, slightly lignified walls; numerous cellular fragments with yellowish or reddish-brown walls; calcium oxalate in monoclinic prisms, 0.010 to 0.100 mm. in length, few, or frequently absent. Macerate 2 Gm. of powdered Rhatany with 10 Cc. of alcohol, with occasional stirring for one hour and filter it. The deep reddish colored filtrate obtained should yield a dark brownish-red precipitate and a deep orange-red filtrate upon the addition of an excess of alcoholic lead acetate T. S., this latter filtrate should yield no precipitate upon the further addition of a drop or two of alcoholic lead acetate T. S., and should give an olive-brown solution having a purplish fluorescence upon the addition of a drop or two of ferric chloride T. S. Aqueous extractive not less than 9 percent. Ash not exceeding 5 percent.

Lactucarium.—Treat Lactucarium with boiling water and filter; the filtrate should be clear while hot, but on cooling it should become turbid; the filtrate should not be colored blue by iodine T. S. (absence of starch) and should also become clear upon the addition of ammonia water or alcohol. An alcoholic solution of Lactucarium should give not more than a faint green color upon the addition of a drop of ferric chloride T. S. (absence of tannin). Powder: Grayish-brown to dark brown, consisting almost entirely of irregular fragments without any cellular structure; when mounted in hydrated chloral T. S.,

the fragments should become clear, showing a granular ground mass, and from this should separate numerous rod-shaped crystals and broad, monoclinic prisms as well as coarse, rosette-shaped, crystal-like masses, that polarize light. Dry the drug at a temperature not exceeding 70° C. for powdering. Ash not exceeding 10 percent.

Leptandra.—Leptandra may include not more than 5 percent. of stems and other foreign matter. Rhizome usually of horizontal growth nearly cylindrical, somewhat branched, from 4 to 10 cm. in length and from 4 to 13 mm. in diameter; externally grayish-brown to dark reddish-brown, annulate from circular scars of bud-scales, upper surface with short stem remnants; occasionally with buds, and numerous circular stem-scars, from the under and lateral portions arise numerous coarse roots; fracture very tough and woody, branches readily separable from the main rhizome; internally bark rather thin, dark brown and resinous, wood about the same thickness as the bark, light brown and porous, pith large, more or less hollow, the color being similar to that of the bark; nearly odorless, taste very bitter and acrid. Roots from 1 to 10 cm. in length and from 1 to 2 mm. in diameter; externally dark brown to purplish-brown, smooth and faintly longitudinally wrinkled: fracture short; internally with a thick brownish-black bark and small light brown central cylinder. Powder: Dark brown and yellowish white; odor strong, penetrating; containing numerous irregular fragments of vegetable tissue, many of them being colored pink or violet upon the addition of hydrated chloral T. S., starch grains numerous, to some extent isolated but mostly in the parenchymatous cells, the individual grains being nearly spherical or more or less polygonal and from 0.002 to 0.008 mm. in diameter; fragments of woody tissues with tracheæ and wood-fibers, tracheæ with spiral thickenings, or with simple or bordered pores, wood-fibers with thick lignified walls, with simple pores or with bordered pores, resembling tracheids; fragments of parenchyma containing a light brown or brownish-black resin, the latter frequently closely coherent with the starch grains in the cells thus preventing the separation of the individual starch grains; in hydrated chloral T. S. mounts, occasional elongated cells with a lemon-yellow oily substance may sometimes be seen.

Limonis Cortex.—The outer rind of the fresh ripe fruit of Citrus medica Limonum (Risso) Hooker filius (Fam. Rutaceæ). The outer, lemon-yellow or dark yellow layer recently separated by grating or paring and consisting of an epidermal layer, numerous parenchyma cells containing yellow chromoplastids and large oil-reservoirs with globules of the volatile oil; odor highly fragrant, distinct; taste pungently aromatic. Under the microscope sections of the fresh fruit when mounted in fixed oils, show an epidermal layer composed of small tabular cells, a hypodermal layer containing numerous plastids, a mesocarp with colorless, thin-walled parenchyma and large, elliptical oil reservoirs; parenchyma cells containing a layer of granular protoplasm adhering to the walls and occasionally membrane crystals of calcium oxalate, which are irregularly polygonal in shape, polarize light strongly and from 0.015 to 0.025 mm. in diameter.

Linum.—Flaxseed may include not more than 3 percent. of other harmless fruits, seeds and foreign matter. Ovate, or oblong-lanceolate, flattened,

obliquely pointed at one end, 3 to 5 mm. in length; externally chestnut-brown, very smooth and shiny, the raphe extending as a distinct, light yellow ridge along one edge; easily cut with the finger-nail, internally olive-green, oily; odor slight; taste mucilaginous and oily. Under the microscope transverse sections when mounted in hydrated chloral T. S. show an epidermis with a mucilaginous layer from 0.010 to 0.015 mm. in thickness, covered by a very thin layer of cutin which is often more or less broken; two layers of parenchyma which overlie a continuous ring of stone-cells having yellowish, porous walls and rather large lumina; a pigment layer, the cells having a reddish-brown content; an endosperm consisting of from 6 to 10 rows of cells, surrounding the two large plano-convex cotyledons; the cells of both the endosperm and the cotyledons contain a fixed oil and aleurone grains, the latter being from 0.003 to 0.020 mm. in diameter. Powder: Lemon-yellow and light brown, consisting chiefly of large, oily globules and irregular fragments of endosperm and seed-coat; the seed-coat is characterized by the tabular pigment cells filled with a reddish-brown, insoluble content and by the somewhat elongated stone cells with yellowish walls; mounts made from material from which the fixed oil has been removed, show aleurone grains from 0.003 to 0.020 mm. in diameter, both free and in the cells of the endosperm and embryo. Linseed or Flaxseed Meal: Light olive-brown with reddish-brown fragments; fragments very coarse and the cellular tissues are the same as those of the powder. Powdered Linseed or Flaxseed and Linseed Meal or Flaxseed Meal should be recently prepared and free from unpleasant or rancid odor, and should be kept in tightly closed containers, to which a few drops of carbon tetrachloride or chloroform should be added from time to time to prevent the attack by insects. Boil 1 Gm. of the fat-free Linseed or Flaxseed Powder or Meal, with 50 Cc. of water, cool and filter; the filtrate should show, on the addition of iodine T. S., not more than a faint blue color. The ground or powdered drug upon extraction with petroleum benzin should yield not less than 30 percent. of a fixed oil, 98 percent. of which should be saponifiable. Ash not exceeding 6 percent.

Lobelia.—Family name changed from "Campanulaceæ" to "Lobeliaceæ." Stems cylindrical, coarsely and irregularly furrowed, yellowish-green, occasionally purplish and with numerous spreading hairs; leaves alternate, usually more or less broken, when entire, laminæ ovate or oblong, 2 to 9 cm. in length, obtusely toothed or irregularly serrate-denticulate, the teeth with a yellowish-brown gland-like apex, pale green and with scattered, bristly hairs; petiole either wanting or 1 mm. in length; flowers in long racemes with short pedicels, calyx tube ovoid, 5-toothed, corolla tubular, 3 to 4 mm. in length, 5-parted, the upper 2-lobed portion cleft nearly to the base; stamens with anthers united above into a curved tube enclosing the bifid stigmas; capsules ovoid or ellipsoidal, 5 to 8 mm. in length, light brown, wholly inferior and enclosing numerous brownish, oblong and coarsely reticulate seeds; odor slight; taste strongly acrid. Powder: Dark green, odor irritating; fragments of seed-coat composed of more or less polygonal cells with thick, yellowish walls; isolated, non-glandular hairs elongated-conical, 0.300 to 0.600 mm. in length; fragments of stem with tracheæ showing annular or spiral thickenings or simple pores associated with narrow wood-fibers, the walls of the latter being rather thin, more or less lignified

and porous; fragments of epidermis of leaf with elliptical stomata, 0.025 mm. in length, and usually with 3 or 4 neighboring cells; pollen grains nearly spherical, 0.015 to 0.030 mm. in diameter. Ash not exceeding 8 percent.

Lupulinum.—A granular powder, bright yellowish-brown, having the characteristic odor and taste of hops; becoming darker in color, disagreeable and valerian-like in odor on aging, when it is unfit to use. Under the microscope the glandular trichomes are somewhat globular or ellipsoidal, 0.150 to 0.200 mm. in diameter, consisting of a single layer of secreting cells assuming the form of a shallow cup, from the inner surface of which the cuticle has been separated by the secreted yellowish-brown oleoresin. Ash changed from "not more than 10 percent." to "not exceeding 16 percent."

Lycopodium.—The spores of Lycopodium clavatum Linné (Fam. Lycopodiaceæ), with not more than 2 percent. of impurities. Under the microscope the spores are spherical tetrahedrons, 0.025 to 0.040 mm. in diameter; in section they vary from plano-convex to triangular, the outer wall or exosporium being extended in the form of slight, irregular projections, giving the edge a ciliate appearance, and the surface of the spore a reticulate appearance, the reticulations being polygonal and formed of straight sides; when viewed so that the rounded surface of the spore is on the under side, the upper surface is characterized by a distinct, triangular marking, being the edges of the three straight surfaces, extending from the center of the spore to near the outer edge. Lycopodium should show very few, if any, pollen grains of species of Pine, the latter being 0.040 to 0.070 mm. in diameter, and consisting of three parts, a central, convex, generative cell separating the two spherical cells or wings which are blackish, due to the inclusion of air. Ash changed from "not exceeding 5 percent." to "not exceeding 3 percent."

Matricaria.—The dried flower-heads of Matricaria Chamomilla Linné (Fam. Compositæ), with not more than 5 percent. of stems and foreign matter. Flower-heads composed of a few white ray florets and numerous yellow disk florets on a conical, more or less hollow receptacle, the latter being 3 to 10 mm. in breadth; disk flowers tubular, perfect, and without a pappus; ray flowers 10 to 20, pistillate, corolla white, 3-toothed, and 4-veined, usually reflexed, involucre hemispherical, composed of 20 to 30 imbricated, oblanceolate, and pubescent scales; peduncles light green to brownish-green, longitudinally furrowed, more or less twisted and attaining a length of 2.5 cm.; achenes somewhat obovoid and faintly 3- to 5-ribbed, pappus none or only a slight membraneous crown; odor pleasant, aromatic; taste aromatic and bitter. Ash not exceeding 13 percent.

Mentha Piperita.—Leaves more or less crumpled and frequently detached from the stems; stems quadrangular, 1 to 2 mm. in diameter, nearly glabrous except for a few scattered deflexed hairs; leaves when entire ovate-oblong to oblong-lanceolate, petioles 4 to 15 mm. in length, slightly pubescent, laminæ 1 to 9 cm. in length, acute and sharply serrate, light green to purplish-brown, upper surfaces nearly glabrous, lower surfaces glandular-hairy especially on the veins; flower-whorls in oblong or oval spikes which are usually compact, or somewhat interrupted at the base, 1 to 1.5 cm. in breadth, rounded at the summit, and in fruit attaining a length of 3 to 7 cm.; bracts oblong-lanceolate, very acuminate,

7 mm. in length; calyx tubular, equally 5-toothed, pubescent and glandular-punctate, often dark purplish in color; corolla tubular-campanulate, 4-cleft, 3 mm. in length and often light purple; stamens 4, short and equal; nutlets ellipsoidal, 0.5 mm. in diameter, blackish-brown; odor pungent, characteristic; taste aromatic, pungent, followed by a cooling sensation.

Mentha Viridis.—Leaves more or less crumpled and mixed with a large proportion of the light brown or purplish-colored stems occasionally with their characteristic opposite branches; stems distinctly quadrangular 1 to 3 mm. in width, nearly glabrous; leaves when entire oblong- or ovate-lanceolate, unequally serrate, nearly sessile or with a petiole less than 5 mm. in length, of a bright green color and somewhat glandular-hairy on the under surfaces; flowers in clusters arranged oppositely and in more or less interrupted or crowded, lanceolate, acute or acutish spikes; bracts subtending the flower clusters linear-lanceolate, subulate, 7 to 10 mm. in length; calyx tubular, 5-toothed, glandular-punctate and somewhat pubescent near the teeth; corolla whitish or light brown; stamens extending beyond the corolla tube; odor slightly pungent, characteristic; taste aromatic, characteristic but not followed by a cooling sensation.

Moschus.—Known in commerce as Tonquin or Tibetan Musk. Usually in small irregular granules, not more than 2 mm. in thickness, blackish, with a few light brown fragments and becoming somewhat grayish on aging; shiny and somewhat oily; odor peculiar, penetrating, powerful and persistent; taste aromatic and bitterish. Add a few granules of Musk to 2 Cc. of water in a watch crystal and stir with a glass rod, a light brown solution should be obtained. The undissolved portion should consist of irregular fragments containing a finely granular substance, numerous rod-like bacteria and occasionally the hyphæ of a fungus. Add a drop of iodine T. S. to a slide containing a few granules of Musk and examine under the microscope; none of the particles should be colored blue or bluish-black (absence of starch). Add a few granules of Musk to 2 Cc. of alcohol contained in a watch crystal; the grains should sink to the bottom, and upon stirring with a glass rod, a pale brown, slightly cloudy solution should be obtained, leaving a somewhat oily stain upon the upper portion of the watch crystal as the alcohol evaporates; the undissolved portion or residue should resemble that obtained with the aqueous mixture, except in that the particles should be less disintegrated. Add a few granules of Musk to 2 Cc. of chloroform in a watch crystal; the grains should float on the surface and upon stirring with a glass rod, the solution should remain nearly colorless, and as it evaporates there should separate around the particles a small quantity of a whitish oily or fatty substance. Not less than 50 percent. of Musk should be soluble in water, the solution being of a dark brown color with a strong, aromatic odor and a slightly acid reaction. Not less than 10 percent. of Musk should be soluble in alcohol, the solution being of a light yellowish-brown color becoming slightly turbid upon the addition of water. Musk, when dried to constant weight in a desiccator over sulphuric acid, should not lose more than 15 percent. of moisture.

Myristica.—Ovoid or ellipsoidal, 20 to 30 mm. in length and about 20 mm. in thickness; externally light brown to dark brown, consisting of the reticulately furrowed perisperm, the broad end with a large, circular, upraised scar from

which arises a furrow extending to the chalaza; easily cut, the surface having a waxy lustre and mottled by reason of the light brown perisperm penetrating into the yellowish-brown endosperm; a longitudinal section through the middle of the large scar shows a small irregular cavity with the more or less shrunken remains of the embryo, and usually containing a growth of mold; odor slightly aromatic, taste agreeably aromatic. Powder: Dark reddish-brown; consisting of irregular, yellowish-brown or brownish-black fragments; fragments of perisperm yellowish-brown with large, circular or elliptical oil reservoirs containing a volatile oil, small, thin-walled parenchyma cells and occasional spiral tracheæ; parenchyma cells of the endosperm more or less polygonal and filled with starch grains and aleurone grains; starch grains single or compound, the individual grains being spherical, plano-convex or polygonal, from 0.003 to 0.020 mm. in diameter and colored blue with iodine T. S. (distinction from starch grains in mace, which are colored yellowish-red; mounts in hydrated chloral T. S. show numerous globules of a fixed oil which later may separate in the form of rod-like crystals; mounts in any of the fixed oils show the separation of spheroidal aggregates of crystals of the fixed oil which polarize light strongly. The powder made from "limed" Nutmeg shows, under the microscope, upon the addition of water containing 25 percent. of sulphuric acid, the immediate separation of crystals of calcium sulphate in the form of small needles or short rods which do not polarize light. Ash not exceeding 5 percent. Broken and wormy kernels should be rejected.

Myrrha.—A gum-resin obtained from one or more species of Commiphora (Fam. Burseraceæ). Powder: Yellowish-brown; 0.001 Gm. of the powder, when added to a slide containing a drop of one of the fixed oils and examined under the microscope, shows numerous angular fragments varying in color from pale yellow to yellowish-brown; hydrated chloral T. S. produces an intensification in the color of the yellowish fragments; the addition of iodine T. S. to the powder previously mounted in hydrated chloral T. S. may show the presence of a few starch grains varying in shape from spherical, polygonal, and narrowly ellipsoidal to somewhat pear-shaped, from 0.010 to 0.035 mm. in diameter; when mounted in phloroglucinol T. S. and hydrochloric acid the powder may show a few fragments of lignified tissues consisting of either sclerenchymatous fibers, or of small groups of stone cells, the individual cells of the latter with very thick, porous walls and from 0.015 to 0.050 mm. in length. Statements about emulsion with water, its insolubility and non-swelling in water, and the nitric acid test on an alcoholic solution omitted. Not less than 35 percent. of Myrrh should be soluble in alcohol. Ash not exceeding 8.5 percent.

Nux Vomica.—Orbicular, nearly flat, occasionally irregularly bent, 10 to 30 mm. in diameter, 4 to 5 mm. in thickness; externally grayish or greenish-gray, covered with appressed hairs giving it a silky lustre, hilum indicated by a circular scar at the center of one of the flattened sides, and connected with the micropyle by a ridge; the micropyle very hard when dry; internally showing a thin and hairy seed-coat and a large grayish-white endosperm at one end of which is embedded a small embryo, with 2 broadly ovate 5- to 7-nerved cotyledons; inodorous; taste persistently bitter. Powder: Light gray; consisting chiefly of thick-walled, endosperm cells containing globules of a fixed oil and

a few small aleurone grains, and fragments of strongly lignified, non-glandular hairs, the walls of the latter possessing large, circular, or long, slit-like pores. In the tissues of the adhering pulp occur a few small, nearly spherical starch grains. The color test with potassium dichromate and sulphuric acid omitted. Ash not exceeding 3.5 percent.

Opii Pulvis.—Temperature for drying changed from "not exceeding 85° C." to "not exceeding 70° C." Light brown, consisting chiefly of yellowish-brown to brownish-red, more or less irregular and granular fragments varying from 0.015 to 0.150 mm. in diameter; a few fragments of strongly lignified thick-walled, 4- to 5-sided or narrowly elongated, epidermal cells of the poppy capsule; and very few fragments of tissues of poppy leaves, poppy capsules, and Rumex fruits.

Opium.—Obtained from Papaver somniferum Linné and its variety album De Candolle (Fam. Papaveraceæ) with not more than 5 percent. of the capsules and leaves of the poppy plant, Rumex fruits, and other foreign matter. In more or less rounded, mostly somewhat flattened masses of variable size, but usually about 8 to 15 cm. in diameter; externally grayish-brown, covered with fragments of poppy leaves and with some fruits of a species of Rumex, adhering from packing; more or less plastic when fresh, becoming hard and brittle on keeping; internally dark brown interspersed with lighter areas, somewhat lustrous; odor characteristic, narcotic; taste bitter, characteristic.

Pepo.—Defined as the "dried" seeds of cultivated varieties of Cucurbita Pepo Linné (Fam. Cucurbitaceæ), with not more than 5 percent. of other harmless seeds. Broadly elliptical or ovate, 15 to 23 mm. in length and 2 to 3 mm. in thickness; externally yellowish-white, very smooth, occasionally with thin,, transparent fragments of adhering pulp, and with a shallow groove parallel to and within 1 mm. of the margin; fracture short, seed coat consisting of a white coriaceous outer layer and a membraneous inner layer occasionally of a dark green color; embryo whitish, straight, with a small conical hypocotyl and two plano-convex cotyledons; slightly odorous when contused; taste bland and oily. Under the microscope sections show an outer epidermal layer consisting of palisade-like cells, the radial walls attaining a length of 1 mm.; the outer walls usually being torn off so that it appears as though the seeds were covered with very long hairs; a sub-epidermal layer consisting of 5 to 12 rows of cells with slightly thickened, lignified and porous walls; a layer of strongly lignified stone cells, elliptical in outline and about 0.075 mm. in length; a single layer of small cells resembling those of the sub-epidermal layer; several rows of spongy parenchyma cells with characteristic reticulate markings and separated from each other by large intercellular spaces; several layers of parenchyma cells, the inner layer being more or less collapsed and bounded on the inside by a single epidermal layer, the cells having rather thick walls; the perisperm cells are usually more or less collapsed and the endosperm consists of a single layer of cells filled with small aleurone grains; the cotyledons consist of thin-walled, isodiametric, elongated or palisade-like cells containing a fixed oil and numerous small aleurone grains.

Petroselini Fructus.—The dried ripe fruits of Petroselinum sativum Hoffmann (Fam. Umbelliferæ), with not more than 5 percent. of foreign seeds and other

vegetable matter. Mericarps usually separated, ovoid crescent shaped, 2 to 3 mm. in length, 1 mm. in diameter; externally grayish-brown becoming grayish- or brownish on aging, having 5 yellowish, filiform, prominent ribs, alternating with the coarsely roughened furrows; in transverse section nearly hemispherical, the commissural surface with 2 vittæ, or oil-tubes, the dorsal surface usually with a single vitta, occasionally 2 vittæ, in the grooves between the primary ribs; endosperm large, oily, enclosing a small embryo; odor and taste characteristic and distinctly aromatic, especially when bruised. Under the microscope sections show an epidermal layer with thick, cuticularized walls having numerous small centrifugal projections; several layers of small, thin-walled parenchyma cells, being usually considerably collapsed; a single large brown elliptical vittæ or oil-tube between each of the primary ribs and surrounded by a layer of comparatively large, yellowish-brown, tangentially elongated cells; a single fibro-vascular bundle more or less surrounded by a few or occasionally numerous, sclerenchymatous fibers; inner epidermis of narrow, thin-walled, elongated cells closely cohering with the brownish tabular cells of the seed-coat; commissural surface usually with 2 large vittæ, a very few stone cells and showing a slight separation of pericarp and seed-coat; endosperm of polygonal, thick-walled, parenchyma cells containing fixed oil and numerous small aleurone grains usually containing a small rosette aggregate of calcium oxalate. The vittæ usually contain yellowish oil globules or a resin-like mass adhering to the walls, and occasionally are divided by a radial wall. Powder: Grayish-brown, mostly of large, irregular fragments; cells of endosperm with aleurone grains, each usually containing a rosette aggregate of calcium oxalate, 0.003 to 0.007 mm. in diameter; fragments with light yellow vittæ and the yellowish-brown cells of the pericarp; fragments with narrow tracheæ and more or less lignified sclerenchymatous fibers.

Physostigma.—Defined as the "dried" seeds. Oblong or ellipsoidal, somewhat compressed reniform, 15 to 30 cm. in length, 10 to 15 mm. in thickness; externally reddish or chocolate brown, smooth, somewhat wrinkled near the brownish-black groove, the latter being 2 mm. in width and extending almost the entire length of the convex edge and in which is found frequently the remains of the white membraneous funiculus, the margins of the seed coat on both sides of the groove somewhat elevated, of a yellowish-red or brownish-red color and somewhat thickened; embryo large, white, with short hypocotyl and two concave-convex cotyledons; taste at first starchy, afterwards acrid. Powder: Grayish-white; starch grains numerous, from 0.005 to 0.150 mm. in diameter, ellipsoidal or somewhat reniform, and usually with a distinct cleft and frequently with radiating or irregular fissures; fragments of seed coat with very thick, reddish-brown cells being either palisade-like shaped, or very irregular and resembling stone cells, but the walls are not lignified; an occasional fragment with tracheæ showing reticulate thickenings. Ash not exceeding 3 percent.

Pilocarpus.—The dried leaflets of Pilocarpus Jaborandi Holmes, in commerce known as Pernambuco Jaborandi, or of Pilocarpus microphyllus, Stapf, known in commerce as Maranham Jaborandi, (Fam. Rutaceæ), with not more than 5 percent. of the rachis (stalks) bearing the leaflets and stems of the same plant. Pernambuco Jaborandi: Leaflets when entire, oval, oblong, or elliptical, 4

to 10.5 cm. in length and 2 to 4 cm. in breadth and with short, stout petiolules; summits more or less rounded or acute and emarginate; bases rounded or acute and mostly unequal; margins, entire and narrowly revolute; very smooth, shiny, coriaceous and glandular-punctate; upper surface grayish to brownish-green, mid-ribs mostly depressed, under surfaces yellowish- or greenish-brown and slightly pubescent on the prominent midvein; peculiarly aromatic when crushed; taste bitterish, becoming somewhat pungent and having a sialagogue effect. Maranham Jaborandi.—Leaflets rhomboidally oval to obovate or elliptical, 1.5 to 5 cm. in length and 1 to 3 cm. in breadth, the lateral ones nearly sessile, the terminal ones on margined petiolules, 0.5 to 1.5 cm. in length; of a nearly uniform grayish or yellowish-green color, rather thin but otherwise resembling Pernambuco Jaborandi. Under the microscope transverse sections show the upper epidermal cells with a yellowish layer of cutin, from 0.005 to 0.010 mm. in thickness; palisade cells, 1 to 3 rows deep, being filled with chloroplastids; among the palisade cells occur large, nearly circular, oil secretion reservoirs 0.080 to 0.150 mm. in diameter; the dorsal pneumatic layer, 10 to 20 rows in depth, the cells occasionally containing rosette aggregates of calcium oxalate from 0.010 to 0.025 mm. in diameter; distributed in the center of the leaf, are the collateral fibro-vascular bundles each surrounded by a more or less interrupted circle of several rows of thick-walled, slightly lignified bast-fibers; tracheæ associated with strongly lignified wood-fibers; among the cells of the lower epidermis occur numerous stomata. On surface view the stomata are broadly elliptical, 0.025 to 0.040 mm. in length, being uniformly smaller in Maranham Jaborandi. Upon both surfaces of Pernambuco Jaborandi occur a number of non-glandular, one-celled hairs, more or less bent or curved, from 0.080 to 0.500 mm. in length, thick-walled and with numerous, slight, centrifugal projections. Powder: Dark green or greenish-brown, epidermal cells on surface view 5- to 6-sided, stomata broadly elliptical, from 0.020 to 0.040 mm. in length, usually with four neighboring cells; fragments of fibro-vascular bundles showing tracheæ with simple or bordered pores or spiral thickenings, associated with thick-walled and strongly lignified wood-fibers; bast-fibers few, walls thick and only slightly lignified; calcium oxalate in rosette aggregates, 0.010 to 0.025 mm. in diameter; fragments of laminæ showing large, oil secretion reservoirs and usually containing one or more globules of an oily substance; non-glandular hairs, having thick walls usually more or less broken, are occasionally found. Ash not exceeding 7 percent.

Piper.—It may include not more than 2 percent. of stems and foreign matter. Nearly globular, 3.5 to 6 mm. in diameter, epicarp very thin, easily separable from the sarcocarp: externally blackish-brown or grayish-black, coarsely reticulate; 1-locular, 1-seeded; seed whitish, hollow, adhering to the pericarp; odor aromatic, slightly empyreumatic; taste aromatic and very pungent. Powder: A mixture of blackish-brown fragments of the pericarp and whitish fragments of the endosperm and embryo; starch grains spherical or somewhat angular, 0.001 to 0.003 mm. in diameter, mostly in the polygonal cells of the endosperm; stone cells of the epicarp varying from nearly isodiametric or palisade-like, to long tapering or somewhat shoe-shaped, with thick, porous walls and large lumina frequently containing a reddish-brown pigment; stone cells of the endocarp

unevenly thickened, the outer walls being usually rather thin, and the lumina usually filled with a reddish-brown substance; oil cells with suberized walls and containing a yellowish oil, in which occasionally separate monoclinic prisms of piperine. Non-volatile ether extract, not less than 6 percent; starch, not less than 25 percent. Ash not exceeding 7 percent. Ash insoluble in diluted hydrochloric acid, not exceeding 2 percent.

Podophyllum.—Defined as the 'dried rhizome and roots." Podophyllum should yield, by the method given under Resina Podophylli, not less than 3 percent. of resin which should conform to the requirements and tests for Resin of Podophyllum. Horizontal, nearly cylindrical, jointed, compressed on the upper and lower surfaces, sometimes branched; in pieces from 3 to 20 cm. in length, the internodes 2 to 9 mm. in diameter; externally dark brown, longitudinally wrinkled or nearly smooth with irregular, somewhat V-shaped scars of scale leaves, nodes annulate, upper portion marked with large, circular, depressed stem-scars and sometimes with buds or stem-bases; at or near the nodes on the lower portion, occur numerous root-scars or roots from 2 to 7 cm. in length and about 2 mm. in thickness; fracture short; internally, bark light brown, wood with small, yellowish, vascular bundles, pith large and white; odor slight; taste sweetish, disagreeably bitter and acrid. Under the microscope a transverse section shows an outer layer of one or two rows of reddish-brown cells; parenchyma of cortex and pith with numerous, single, spherical, polygonal, or 2- to 6-compound starch grains, or rosette aggregates of calcium oxalate; vascular bundles 24 to 34 arranged in a circle between cortex and pith. Powder: Light brown and with a pronounced and characteristic odor; starch grains numerous, spherical, polygonal or 2- to 6-compound, the individual grains from 0.003 to 0.015 mm. in diameter, calcium oxalate crystals few, in rosette aggregates from 0.050 to 0.080 mm. in diameter, and occasionally in raphides 0.030 to 0.090 mm. in length; tracheæ with simple pores or reticulate thickenings; fragments of starch-bearing parenchyma and reddish-brown cork cells. Ash not exceeding 3 percent.

Prunus Virginiana.—To consist of the "stem-bark." Usually in transversely curved pieces from 2.5 to 8 cm. in length and 0.5 to 4 mm. in thickness; outer surfaces light brown or greenish-brown, smooth, except for numerous lenticels from 3 to 4 mm. in length; inner surfaces light brown, longitudinally striate and occasionally fissured; fracture short, granular; odor distinct, bitter-almond-like, when macerated in water; taste astringent, aromatic, and agreeably bitter. Under the microscope sections show a tendency for the separation in radial segments or bands of the phloem tissues from the rather broad medullary rays; periderm usually of a few layers of cells; outer bark from young twigs with 1 or 2 nearly continuous layers of stone cells, the latter being of very irregular shape, often branching and with thick, lamellated, porous walls, medullary rays extending as more or less scythe-shaped groups from the cambium to the outer bark, from 1- to 10-cells in width, some of the cells occasionally being modified to stone cells; in between the medullary rays occur numerous small groups of stone cells, resembling those of the outer bark and occasionally modified to sclerenchymatous fibers; calcium oxalate mostly in crystal-fibers consisting of monoclinic prisms, 0.015 to 0.040 mm. in diameter, also in rosette aggregates,

0.010 to 0.020 mm. in diameter; starch grains numerous, occurring in the medullary rays and parenchyma. Powder: Light brown; bast-fibers and stone cells with thick, strongly lignified walls; crystal-fibers with monoclinic prisms and rosette aggregates of calcium oxalate, from 0.020 to 0.040 mm. in diameter; starch grains nearly spherical, from 0.003 to 0.004 mm. in diameter.

Pyrethrum.—Defined as the "dried" root. Nearly cylindrical, slightly tapering, usually in pieces, 2.5 to 10 cm. in length, 5 to 20 mm. in diameter; externally dark brown, deeply longitudinally furrowed and somewhat wrinkled, occasionally bearing short, tough, hair-like rootlets, crown more or less annulate and occasionally tufted with coarse fibers or with long, soft-woolly nearly straight, 1-celled hairs; fracture short; bark dark brown with 1 or 2 circular rows of resin ducts, closely adhering to the light yellow, radiate, porous wood, in the medullary rays of which occur 1 to 3 rows of resin ducts; odor distinct; taste sweetish, pungent, very acrid, tingling and producing a strong sialagogue effect. Powder: Light to dark brown; consisting of numerous spherical or irregular masses of inulin, the nature of which is especially seen with polarized light, and lignified fragments of the woody tissues and stone cells associated with cork; inulin in spherical granules or irregular masses, 0.010 to 0.100 mm. in diameter; which is not affected upon the addition of iodine T. S., tracheæ with simple pores and reticulate or scalariform thickenings, usually associated with wood parenchyma and with few or no wood-fibers; stone cells in groups resembling those of fruits and seeds, the cells more or less tabular in outline, and with thick, yellowish, porous walls; cork in yellowish-brown or dark brown fragments. Ash not exceeding 5 percent.

Quassia.—Jamaica Quassia: Usually in chips, raspings or shavings, occasionally in billets; yellowish-white or bright yellow, with a few light gray pieces somewhat coarsely grained; fracture tough, fibrous; odor slight; taste bitter. Under the microscope sections of Jamaica Quassia show large tracheæ either single or in groups of 2 to 5, the walls being marked by numerous, small bordered pores, and the contents being often of a yellowish color; medullary rays mostly 1 to 5 cells wide and from 10 to 20 rows deep; calcium oxalate in crystal-fibers near the medullary rays, in 4- to 6-sided prisms, from 0.006 to 0.030 mm. in length; wood-fibers with thin walls and oblique pores; starch grains few, spherical or ellipsoidal, 0.010 to 0.015 mm. in diameter. Surinam Quassia: The crude drug and microscopic sections closely resemble the Jamaica variety; tracheæ usually single or in pairs, sometimes in groups of 3 or 4; medullary rays in narrower and larger groups than in the Jamaica variety, from 1 to 4 cells wide and from 10 to 30 rows deep; calcium oxalate crystals few or entirely wanting and distinguishing this variety from Jamaica Quassia.

Rhamnus Purshiana.—The dried bark of the trunk and branches of Rhamnus Purshiana De Candolle (Fam. Rhamnaceæ). Usually in flattened or transversely curved pieces, occasionally in quills, bark 1 to 5 mm. in thickness; outer surface dark brown or brownish-red, longitudinally ridged, often nearly covered with grayish or whitish lichens, bearing small blackish apothecia, sometimes with numerous lenticels; and occasionally with mosses; inner surface light yellow, light brown, or reddish-brown, longitudinally striate, turning red when moistened with solutions of the alkalies; fracture short, with projections of bast-

fibers in the inner bark; in cross section inner bark shows diagonal or curved medullary rays, forming converging groups, the outer bark showing yellowish groups of stone cells which are especially apparent on moistening the freshly cut surface with phloroglucinol T. S. and hydrochloric acid; odor distinct; taste disagreeable, bitter, slightly acrid. Under the microscope a transverse section shows an outer yellowish-brown or reddish-brown corky layer consisting of 10 to 15 or more rows of cells; stone cells in outer bark in tangentially elongated groups of 20 to 50 cells, the walls being very thick and finely lamellated; medullary rays 1 to 4 cells wide, 15 to 25 cells deep, the contents being colored red upon the addition of solutions of the alkalies to the sections; bast-fibers in tangentially elongated groups in the inner bark, the walls being thick and strongly lignified; crystal-fibers around the bast-fibers with individual crystals from 0.008 to 0.015 mm. in length, parenchyma with spheroidal starch grains about 0.003 to 0.008 mm. in diameter, or with calcium oxalate either in rosette aggregates or prisms from 0.010 to 0.020 mm. in diameter. Add 0.100 Gm. of powdered Cascara Sagrada to 10 Cc. of hot water, shake the mixture occasionally until cold, filter it, and add sufficient water to make 10 Cc.; on the addition of 10 Cc. of ammonia water to this liquid it should be colored an orange yellow. Macerate 0.100 Gm. of powdered Cascara Sagrada with 10 drops of alcohol, boil the mixture with 10 Cc. of water, when cold filter it and shake the filtrate with 10 Cc. of ether; a yellow ethereal solution should separate. Shake 3 Cc. of this ethereal solution with 3 Cc. of ammonia water; the separated ammoniacal solution still should possess, on diluting with 20 Cc. of water, a distinct, yellowish-red color. Powder: Light brown to olive brown, showing the characteristic elongated groups of bast-fibers associated with crystal-fibers, the crystals in the latter being in the form of monoclinic prisms, from 0.008 to 0.015 mm. in length; stone cells in large groups, the cells having thick and finely porous walls; fragments of parenchyma and medullary ray cells colored red upon the addition of solutions of the alkalies; starch grains either free or in parenchyma cells, the individual grains being somewhat spheroidal, from 0.003 to 0.008 mm. in diameter; calcium oxalate in monoclinic prisms or rosette aggregates from 0.010 to 0.020 mm. in diameter; occasional fragments of reddish-brown cork. Ash not exceeding 8 percent.

Rhcum.—In subcylindrical, barrel-shaped, conical pieces known in commerce as "rounds," or in plano-convex pieces known in commerce as "flats" or irregular pieces, frequently with a perforation; hard and moderately heavy; attaining a length of 17 cm. and a diameter of 10 cm., or cut in pieces of variable form and size; outer surface yellowish-brown, mottled, with alternating, longitudinal striæ of grayish-white parenchyma and reddish or brownish medullary rays, small stellate groups of fibro-vascular tissue and occasionally reddish-brown cork patches, smooth and sometimes covered with a bright, brownish-yellow powder; fracture uneven and granular, presenting a characteristic, mottled appearance; odor aromatic, characteristic; taste slightly bitter, astringent; gritty when chewed, tingeing the saliva yellow. Under the microscope sections of Rhubarb show numerous thin-walled parenchymatous cells containing either a large number of starch grains or a single rosette aggregate of calcium oxalate; scattered among the parenchyma are stellate groups of compound

fibro-vascular bundles, the latter composed of narrow medullary rays separating the wedges, having large tracheæ in the outer part and separated by a prominent cambium from an internal phloem or sieve; among the grayish-white parenchyma of the inner bark occur narrow, yellowish-brown, irregular medullary rays. Not more than 15 percent. of Rhubarb should have a hollow or dark central area. Powder: Bright orange-yellow to yellowish-brown; becoming red with alkalies; calcium oxalate in rosette aggregates, mostly 0.050 to 0.100 mm. in diameter, occasionally attaining a diameter of 0.150 mm.; starch grains numerous, somewhat spherical, single or 2- to 4-compound, each with a single cleft, from 0.002 to 0.020 mm. in diameter; tracheal fragments few, mostly reticulate, occasionally spiral. Boil 0.100 Gm. of powdered Rhubarb with 10 Cc. of an aqueous solution of potassium hydroxide, (1 in 100) allow it to cool, filter, acidulate the filtrate with hydrochloric acid and shake it with 10 Cc. of ether; on standing, the ethereal layer should be colored yellow. On shaking this ethereal solution with 5 Cc. of ammonia water, the latter should be colored cherry-red (presence of emodin) and the ethereal layer should remain yellow (presence of chrysophanic acid). Diluted alcohol extractive, not less than 30 percent. Ash not exceediing 13 percent.

Sabal.—The partially dried, ripe fruits of Serenoa serrulata (Roemer and Shultes) Hooker filius (Fam. Palmæ). Ellipsoidal or ovoid, occasionally compressed, 1.5 to 3 cm. in length, 1 to 1.5 cm. in diameter; externally brownish-black to bluish-black, smooth and somewhat oily, with a few large, somewhat angular depressions due to the contraction of the inner layer on drying, summit marked by scar of style, and base either with a short stalk or stem-scar; epicarp and sarcocarp together forming a thin coriaceous shell enclosing a hard but thin endocarp which is externally reddish-brown and somewhat fibrous as is also the inner layer of the sarcocarp; inner layer of endocarp smooth, enclosing a hard ellipsoidal or ovoid, somewhat flattened, reddish-brown seed; odor pronounced, aromatic; taste sweetish, aromatic, slightly acrid. Powder: Yellowish-brown, consisting of large, irregular fragments; parenchyma cells of sarcocarp containing a yellowish-brown or brownish-red, amorphous substance; whitish fragments of endosperm, the walls being considerably thickened and with large pores; stone cells occasional, nearly colorless, more or less tabular or irregular in shape, 0.125 mm. in length, walls 0.015 mm. in thickness and with numerous simple or branching pores.

Sanguinaria.—The dried rhizome "and roots" of Sanguinaria canadensis "collected after the death of the foliage" is omitted. Of horizontal growth, occasionally branching, more or less cylindrical, somewhat flattened, from 2 to 7 cm. in length, and from 5 to 15 mm. in diameter; externally dark brown, slightly annulate, with a few stem scars on the upper surface and numerous more or less broken filiform roots and root-scars on the lower surface; fracture short and somewhat waxy, brownish-red, occasionally yellowish-white, with numerous, small, circular, yellowish fibro-vascular bundles within about 1 mm. of the epidermis, pith very large; odor slight; taste persistently acrid and bitter. Under the microscope transverse sections of the rhizome show an outer layer of a single row of thin-walled epidermal cells, a cortex of 10 to 15 rows of thin-walled parenchyma cells containing numerous starch grains, or a small amount

of fixed oil; a zone of cambium, most of which is interfascicular; a narrow circular zone of small collateral fibro-vascular bundles, separated from each other by parenchyma; pith large, consisting of starch-bearing parenchyma cells; latex cells containing a red or orange colored secretion, either isolated or connected into irregular chains and distributed among the parenchymatous cells of the middle bark and pith; sections treated with glycerin show in the secretion cells, after 24 hours, spheroidal aggregates of crystals which strongly polarize light. Powder: Brownish-red, sternutatory; starch grains numerous, 0.003 to 0.020 mm. in diameter, being mostly single, seldom 2- to 3-compound, the individual grains nearly spherical or ovoid, sometimes more or less plano-convex, somewhat resembling those of wheat starch in outline but which polarize light more strongly; numerous fragments of short latex cells with reddish-brown resinous masses; tracheal fragments few, having numerous transverse slit-like pores.

Santalum Rubrum.—Usually in the form of a coarse powder, of a brownish-red or dark saffron color and nearly inodorous and tasteless. Under the microscope it shows numerous wood-fibers which are mostly irregular in outline, with sharply pointed and occasionally forked ends, the individual fibers from 0.300 to 0.750 mm. in length, the walls being very thick, porous, yellowish, unevenly thickened and strongly lignified, and the lumina being filled with a fine, granular, protoplasmic content; occasional tracheæ with simple or bordered pores and filled with light lemon-yellow, resinous masses; occasionally fragments showing medullary ray cells in narrow elliptical groups 1 cell wide and 3 to 6 cells deep; also occasional groups of crystal-fibers with calcium oxalate in the form of monoclinic prisms, from 0.010 to 0.020 mm. in diameter. Mounts in hydrated chloral T. S. are of a deep, rich, red color. Add 0.500 Gm. of Red Saunders to 10 Cc. of Alcohol; the solution should become distinctly red. Add 0.500 Gm. of Red Saunders to 10 Cc. of ether; the solution should assume an orange-yellow color and when held in a bright light should show a distinct, greenish fluorescence. Add 0.005 Gm. of Red Saunders to 10 Cc. of water; the solution should remain clear and colorless. Ash not exceeding 3 percent.

Sarsaparilla.—The dried root of Smilax medica Chamisso and Schlechtendal, known in commerce as Mexican Sarsaparilla; or Smilax officinalis Kunth, or an undetermined species of Smilax, known in commerce as Honduras Sarsaparilla; or Smilax papyracea Duhamel, known in commerce as Para Sarsaparilla; or Smilax ornata Hooker filius known in commerce as Jamaica Sarsaparilla (Fam. Liliaceæ). Mexican Sarsaparilla: In loose bundles, or pressed into bales, single bundles attaining a length of 60 cm. and composed of 20 to 35 folded roots attached to a crown with one or more stout stems; roots 3.5 to 6 mm. in diameter; externally grayish-brown to dark brown, minutely hairy, longitudinally furrowed, the furrows containing more or less of a blackish earth; fracture tough, fibrous; internally light brown with a more or less shrunken, mealy or sometimes horny cortex surrounding the porous central cylinder, pith distinct; nearly inodorous; taste mucilaginous, somewhat sweetish and acrid. The woody, knotty crown with portions of the overground stems should be removed. Honduras Sarsaparilla: In more or less compact, cylindrical bundles, attaining a length of 55 cm. and a diameter from 8 to 15 cm., consisting of the long, folded roots bound together by roots of the same plant; roots 2 to 6

mm. in diameter; externally dark or reddish-brown, longitudinally furrowed, the furrows usually free from soil; fracture fibrous; internally consisting of a grayish-white or dark brown cortex, a light yellow and porous central cylinder and a whitish pith; taste mucilaginous and slightly acrid. Para Sarsaparilla: In very compact, cylindrical bundles, attaining a length of 1 M. and a diameter of 20 cm., closely bound with the stem of a vine and with the ends evenly trimmed; the roots otherwise resembling those of Honduras Sarsaparilla. Jamaica Sarsaparilla: In more or less compact and somewhat flattened bundles, 30 to 45 cm. in length, 10 to 15 cm. in width, consisting of the folded roots loosely bound with roots of the same plant; roots 2 to 5 mm. in diameter; externally grayish-brown to reddish-brown, longitudinally wrinkled, more or less furrowed and bearing numerous coarse fibrous rootlets; taste slightly sweetish and bitterish. Under the microscope transverse sections of all of the commercial varieties of Sarsaparilla show an epidermal layer with basal portions of root hairs; a hypodermis composed of several layers of strongly lignified cells, the walls being uniformly thickened except in Mexican Sarsaparilla in which the inner walls are only slightly thickened; a cortex composed of numerous parenchyma cells mostly containing starch, some containing resin or raphides of calcium oxalate; and endodermis of a single layer of strongly lignified cells, the walls being uniformly thickened except in Mexican Sarsaparilla in which the outer walls are only slightly thickened; a central cylinder composed of radial bundles connected with sclerenchymatous fibers, the tracheæ being large and oval and the phloem in small groups at the periphery of the bundle; and a pith composed of starch-bearing parenchyma. Powder: Light grayish-brown to dark grayish-brown; starch grains numerous 0.003 to 0.023 mm. in diameter, spherical, or biconvex or spherical-tetrahedral, single, or 2- to 4-compound, and frequently with a central elliptical cleft; calcium oxalate in raphides, 0.006 to 0.035 mm. in diameter, occurring singly or in groups; cells of the hypodermis and endodermis with lemon-yellow or reddish-yellow porous walls and in the case of Mexican Sarsaparilla showing an uneven or irregular thickening, the individual cells, 0.080 to 0.500 mm. in length; fragments of tracheæ with simple and bordered pores or scalariform or reticulate thickenings associated with sclerenchymatous fibers having rather thin, very slightly lignified and porous walls. Ash not exceeding 10 percent.

Sassafras.—The drug may include not more than 2 percent. of adhering wood. In irregularly transversely curved or quilled pieces, 1 to 15 cm. in length, 1 to 4 mm. in thickness; outer surface orange-brown, nearly smooth and marked with more or less irregular ridges; inner surface light to dark reddish-brown, obscurely short-striate; fracture short with a thin reddish-brown corky layer and a yellowish-white inner bark; odor aromatic; taste slightly mucilaginous, astringent, aromatic and somewhat pungent. Powder: Light reddish-brown, containing numerous starch grains and prominent, characteristic bast-fibers; starch grains either single or 2- to 4-compound, the individual grains being more or less spherical or polygonal and frequently with a distinct cleft, 0.003 to 0.020 mm. in diameter, some of the swollen or altered grains attaining a diameter of 0.030 mm.; bast-fibers spindle-shaped, occasionally very irregular in outline, with sharply pointed ends, from 0.150 to 0.400 mm. in length, 0.025 mm. in

diameter, and with very thick, strongly lignified walls, the lumina being frequently nearly obliterated; parenchyma cells containing either starch grains or irregular yellowish-red masses of tannin and becoming bluish-black upon the addition of ferric chloride T. S., fragments of wood few, with large, thin-walled tracheæ marked by simple pores and associated with rather thin-walled wood-fibers. Ash not exceeding 30 percent.

Scammoniæ Radix.—The dried root of Convolvulus Scammonia, Linné (Fam. Convolvulaceæ), yielding when assayed by the process given below, not less than 8 percent. of total resins of Scammony Root. Cylindrical or somewhat tapering, from 10 to 25 cm. in length, 1 to 4.5 cm. in thickness; externally grayish to reddish-brown; usually distinctly twisted, deeply longitudinally furrowed, marked by distinct root scars, otherwise nearly smooth except for the lenticels and abraded cork, the upper portion terminated usually by a number of short stem branches; hard and heavy; fracture tough, irregular with projecting wood-fibers; internally somewhat mottled showing yellowish, porous wood-wedges separated by whitish parenchyma containing starch and resin; bark thin; odor slight, resembling that of jalap; taste very slightly sweet becoming slightly acrid. Under the microscope sections of Scammony Root show a corky layer consisting of 2 to 10 rows of cells with thin, yellowish-brown lignified walls; an outer cortex with numerous stone cells occurring singly or in small groups, the walls being moderately thick, porous and not strongly lignified; parenchyma with numerous starch grains and monoclinic prisms of calcium oxalate; fibro-vascular bundles numerous, circular or elliptical with a well developed wood consisting of large tracheæ surrounded with slightly lignified wood-fibers; phloem and sieve prominent and in which are included large resin ducts; the parenchyma both in and surrounding the bundles more or less collapsed and containing either starch or calcium oxalate crystals. Powder: Light grayish-brown; starch grains from 0.003 to 0.018 mm. in diameter, mostly single, occasionally 2- to 4-compound, the grains showing occasionally a central cleft; calcium oxalate crystals numerous, in monoclinic prisms from 0.010 to 0.045 mm. in length, fragments of leptome or sieve with yellowish-brown resin cells; tracheæ mostly with reticulate thickenings and simple or bordered pores and associated with short wood-fibers with prominent oblique pores; stone cells of variable shape and varying from 0.040 to 0.110 mm. in length, the walls being from 0.006 to 0.012 mm. in thickness, slightly lignified and traversed with prominent often branching pores; lignified cork cells relatively few.

Scilla.—The fleshy, inner scales of the bulb of the white variety of Urginea maritima Linné Baker (Fam. Lilaceæ) cut into pieces and carefully dried. In irregular, more or less curved, somewhat flattened and translucent pieces, 0.5 to 5 cm. in length, yellowish-white, nearly smooth and shiny with slight projections of fibro-vascular bundles, brittle when dry and somewhat flexible when damp; odor slight; taste bitter and acrid. Under the microscope sections of the scales show on the upper and lower surfaces a thin-walled, epidermal layer, a mesophyll of nearly isodiametric or slightly elongated thin-walled cells, and occasionally showing in alcoholic or glycerin mounts spheroidal aggregates of a carbohydrate; numerous more or less rectangular cells containing mucilage and bundles of raphides of calcium oxalate, the latter from 0.075 to 1.0 mm. in

length; fibro-vascular bundles few and isolated, with spiral or reticulate tracheæ. Occasionally some of the parenchyma cells contain a few, somewhat spherical starch grains. Powder: Light yellow, with a tendency to cake in moist atmosphere, consisting of very irregular fragments; single crystals and bundles of long raphides of calcium oxalate numerous; fragments of thin-walled, colorless parenchyma, frequently with dark intercellular spaces due to the inclusion of air; fragments with spiral or reticulate tracheæ occasional. Ash not exceeding 8 percent.

Senega.—The roots may include not more than 5 percent. of stems and other foreign matter. Usually in broken pieces, when entire, slenderly conical, more or less tortuous, somewhat branched, 3 to 15 cm. in length and 2 to 10 mm. in thickness and bearing a few rootlets; crown knotty with numerous buds and short stem-bases; externally brownish-yellow, the crown rose-tinted, longitudinally wrinkled, frequently marked by a keel; fracture short, wood pale yellow, usually eccentrically developed, odor peculiar, penetrating, taste sweetish, afterwards acrid. Under the microscope transverse sections usually show a characteristic eccentric development of wood, the central cylinder varying in outline from elliptical or ovate to irregularly fan-shaped, and being surrounded by an unevenly developed cortex being thickest outside the broadest strands of wood, and where the wood wedges are narrow and the medullary rays very broad, the cortical parenchyma occupies a very narrow zone of the cross-section; in older roots a corky layer of 4 or 5 rows of tangentially elongated, light yellowish or yellowish-brown cells; outer bark of about 20 rows of cells on one side of the root and only 10 or less on the other, the cells having slightly thickened walls and containing a colorless or pale yellowish amorphous substance, which is liberated in the form of large globules on the addition of a drop of potassium hydroxide T. S.; inner bark, the cells in radial rows, consisting of parenchyma, small groups of sieve tissue, and medullary rays, the latter 1 to 3 cells wide, all the cells in this zone show a collenchymatous thickening of the walls and contain an amorphous substance similar to that found in cells of the outer bark; woody layer of tracheæ with bordered pores, wood-fibers with oblique, simple pores, tracheids, and medullary rays, the latter being rather indistinct and resembling the wood-fibers; tissues of the central layer of wood colored yellowish or reddish-brown on the addition of a drop of potassium hydroxide T. S. Powder: Yellowish-gray to light yellowish-brown, odor penetrating, slightly sternutatory; consisting of a mixture of fragments of parenchyma containing oily globules and wood-fibers with tracheæ; wood-fibers, non-lignified and with oblique, simple pores, from 0.175 to 0.250 mm. in length; tracheæ with simple and bordered pores and about 0.175 mm. in length; medullary ray cells somewhat lignified and with large simple pores. Extract 10 Gm. of powdered Senega by means of a Soxhlet apparatus, using 50 Cc. of ether to which 2 drops of hydrochloric acid have previously been added. Continue the extraction for 4 or 5 hours and then add sufficient ether to make the liquid measure 50 Cc. Take 25 Cc. of this solution and evaporate it on a water-bath to dryness, the residue should not weigh less than 0.300 Gm. and upon dissolving the residue with 10 Cc. of chloroform, transferring it to a test-tube and pouring 5 Cc. of sulphuric acid beneath the solution, a reddish-brown color should be produced

at the zone of contact and the sulphuric acid should show a slightly green fluorescence after the mixture has stood for twenty-four hours. If 10 Cc. of the original ethereal solution be poured in a beaker in which previously has been placed 10 Cc. of water and the mixture warmed on a water-bath until the ether has been evaporated, the aqueous solution, upon filtering and adding a few drops of ferric chloride T. S., should become a bright pink-purple. Ash not exceeding 5 percent.

Senna.—The drug may include not more than 10 percent. of stem tissues, pods, seeds, and other impurities. Alexandria Senna: Usually entire, sometimes more or less broken, leaflets inequilaterally lanceolate or lance-ovate, from 2 to 3.5 cm. in length, from 6 to 10 mm. in breadth, having extremely short, stout petiolules; acutely cuspidate, entire, subcoriaceous brittle, pale green or grayish-green, sparsely and obscurely hairy, especially beneath, the hairs appressed; odor characteristic; taste somewhat mucilaginous and bitterish. Pods few, broadly elliptical, somewhat reniform, dark green, thin and membraneous. India Senna: Leaflets usually entire, from 2 to 5 cm. in length, and from 6 to 14 mm. in breadth, usually more abruptly pointed than those of Alexandria Senna, yellowish-green and smooth above, paler beneath; in odor and taste closely resembling Alexandria Senna. Pods few, elliptical, more or less reniform and from 4 to 5 cm. in length. Powder: Alexandria Senna; light green; nonglandular hairs, 1-celled, conical, often curved, from 0.100 to 0.350 mm. in length, walls thick and papillose; calcium oxalate in rosette aggregates, from 0.009 to 0.010 mm. in diameter, and in 4- to 6-sided prisms, about 0.015 mm. in length, usually in crystal-fibers; stomata broadly elliptical, about 0.020 mm. in long diameter. In India Senna the powder is slightly darker green than that of Alexandria Senna and the hairs are relatively fewer. Mix 0.5 Gm. of powdered Senna with 10 Cc. of a solution of potassium hydroxide in alcohol (1 in 10), boil the mixture for about 2 minutes, dilute it with 10 Cc. of water and filter. Then acidify the filtrate with hydrochloric acid, shake it with ether; remove the ethereal layer and shake it with 5 Cc. of ammonia water; the latter should be colored yellowish-red. Ash not exceeding 12 percent. Ash insoluble in hydrochloric acid not exceeding 3 percent.

Serpentaria.—The drug may include not more than 10 percent. of the stems. Rhizome oblique, subcylindrical, more or less curved, from 10 to 30 mm. in length and from 1 to 2 mm. in diameter; externally dark brown, upper portion with short stem-bases, from lower and lateral portions, and numerous, long, thin, nearly straight, yellowish-brown roots; fracture short; internally yellowish-white, wood with broad, eccentric wedges; odor terebinthinate; taste bitter, aromatic. Under the microscope transverse sections of the rhizome show an outer layer of cork cells; a cortex of 10 to 15 rows of parenchyma, inner bark with strongly lignified bast-fibers either single or distributed in a more or less interrupted circle; a xylem of broad wood wedges separated by broad medullary rays about 8 cells wide, the walls being strongly lignified and with numerous simple pores; pith eccentric, composed of polygonal cells, the walls being lignified and porous. Starch in the cells of cortical parenchyma, medullary rays and pith. The root in transverse section shows a compact, 4- to 6-rayed stele, and a large starch-bearing cortical area. The stem in transverse section

shows an interrupted circle of 6 to 10 fibro-vascular bundles; a cortex with a prominent, continuous ring of strongly lignified cells, and a few non-glandular hairs. Powder: Grayish-brown; starch grains numerous, single and 2- to 4-compound, the individual grains being more or less spherical or plano-convex, and frequently with a central cleft; from 0.003 to 0.014 mm. in diameter; lignified elements numerous, consisting of tracheæ, wood-fibers, medullary ray cells and pith cells; a few non-glandular hairs of the stem are occasionally present.

Sinapis Alba.—The drug may include not more than 5 percent. of other harmless seeds and other foreign matter. Subglobular, from 1.5 to 2.5 mm. in diameter; testa yellowish, nearly smooth; embryo yellowish, oily, with 2 large cotyledons; inodorous, taste mildly pungent, acrid. Powder: Light yellowish or pale brownish-yellow, developing a slight odor when moistened; consisting mostly of tissues of the embryo, containing small aleurone grains and a fixed oil, the latter forming in large globules on the addition of hydrated chloral T. S.; fragments of seed-coat comparatively few, nearly colorless with small, characteristic stone cells and large epidermal cells, the outer walls being mucilaginous. White Mustard does not yield allyl isothiocyanate upon distillation with steam (distinction from Black Mustard). Starch not exceeding 2.5 percent. Starch test of U. S. P. VIII omitted. Ash not exceeding 9 percent.

Sinapis Nigra.—The drug may include not more than 5 percent. of other harmless seeds and other foreign matter. Ellipsoidal or irregularly spheriodal, from 1 to 1.6 mm. in diameter; testa deep reddish-brown, sometimes yellowish-brown and with a grayish tinge, minutely pitted or reticulate; embryo greenish-yellow or dark yellow, oily, with 2 large cotyledons; odor when dry, slight, on moistening very irritating; taste strongly pungent, acrid. Powder: Light brown or greenish-brown; on moistening developing a strong, pungent, irritating, characteristic odor; consisting mostly of tissues of the embryo, the cells containing small aleurone grains and a fixed oil, the latter forming in large globules on the addition of hydrated chloral T. S.; fragments of seed-coat conspicuous, with large polyhedral, dark yellow areas, enclosing small yellowish stone cells each of the latter with a dark lumen. The powder should contain few or no starch grains. Black mustard upon distillation with steam yields allyl isothiocyanate (distinction from White Mustard). Starch not more than 2.5 percent. Starch test of U. S. P. VIII omitted. Ash not exceeding 9 percent.

Spigelia.—The rhizome and roots may include not more than 10 percent. of stems and other foreign matter. Rhizome horizontal or slightly oblique, more or less flexuous, somewhat branched, from 1.5 to 5 cm. in length, from 2 to 5 mm. in diameter; externally dark brown, slightly annulate with scars of bud scales, the upper surface knotty from approximate stem-bases, bearing cup-shaped scars; from the lower and lateral portions arise numerous long, rather coarse, sparingly branched, brittle roots; fracture short, internally differentiated into three nearly equal zones of pith, wood and bark; odor slightly aromatic; taste bitter, pungent. Few, if any, of the roots should exhibit thin, terminal portions with the bark stripped from the slender strands of wood; stems usually attached to the upper portions of the rhizome nearly cylindrical, attaining a length of 6 cm. and a diameter of 3 mm., light grayish-brown to purplish-brown, nodes

annulate, marked by opposite leaf-scars. Under the microscope transverse sections of the rhizome show a dark brown, more or less exfoliated epidermal layer; a cortex composed of 10 to 15 rows of starch-bearing parenchyma; a distinct zone of sieve tissue from 0.075 to 0.150 mm. in width; a compact woody area composed of tracheæ and tracheids which are hardly distinguishable from each other, both kinds of vessels being marked with bordered pores; an internal sieve closely resembling the sieve in the bark; and a pith composed of fairly uniform, nearly polygonal, thin-walled cells, more or less filled with small starch grains. Cystoliths and stone cells are both absent (distinction from Ruellia ciliosa Pursh. [Fam. Acanthaceæ]). Transverse sections of the root show a rather large cortex, the cells of which are more or less filled with small starch grains and a central stele of 6 or 8 radial fibro-vascular bundles which in the older roots are united by a strong development of lignified cells. The stem in transverse section is distinguished from the rhizome by a narrower woody zone, the tracheæ having spiral thickenings, and by a nearly uninterrupted circle of non-lignified bast-fibers in the bark. Powder: Grayish-brown; starch grains relatively numerous, frequently relatively few, spherical or slightly angular, from 0.002 to 0.006 mm. in diameter; fragments containing lignified tracheæ and tracheids conspicuous; fragments of tracheæ with spiral thickenings relatively few; bast-fibers few, very long, non-lignified, occasional fragments of the reddish-brown epidermal cells. Ash not exceeding 10 percent.

Staphisagria.—The drug may include not more than 2 percent. of foreign vegetable matter. Irregularly triangular, flattened, or somewhat tetrahedral, one side being convex, from 4 to 7 mm. in length, from 3 to 6 mm. in breadth; externally dark brown, becoming lighter with age, and coarsely reticulate; easily cut, showing a somewhat light brown oily endosperm, enclosing a small embryo at the pointed end; odor slight, disagreeable; taste intensely bitter and acrid. Under the microscope transverse sections show an outer layer of nearly tabular, thick-walled, non-lignified cells, some being extended centrifugally, and forming the reticulations of the seed-coat; 2 or 3 rows of parenchyma cells with more or less irregular thin walls; a thin layer of very small, thick-walled cells with numerous, lattice-like or reticulate pores; endosperm large, composed of polygonal cells enclosing small aleurone grains and fixed oil, the latter forming in large globules on the addition of hydrated chloral T. S.

Stillingia.—When entire, terete, unequally tapering, rarely branched, attaining a length of 40 cm., from 0.5 to 3 cm. in diameter, usually in pieces; externally reddish-brown, longitudinally wrinkled; fracture very fibrous, externally, the bark light reddish-brown, thick, spongy, finely fibrous, with numerous resin cells and easily separable from the porous, radiate wood; odor distinct; taste bitter, acrid and pungent. Powder: Pinkish-brown or light reddish-brown; starch grains numerous, from 0.005 to 0.035 mm. in diameter, mostly single, very variable shape, and usually with a central cleft, numerous fragments, with more or less tabular secretion cells, containing a reddish-brown, amorphous, resinous substance; fragments of tracheæ mostly with simple pores and associated with wood-fibers, the walls being very thin, lignified and possessing numerous, transverse slit-like, simple pores; bast-fibers long, narrow, the walls thick and slightly lignified; fragments of reddish-brown cork cells; occasionally a crystal of cal-

cium oxalate in rosette aggregates about 0.035 mm. in diameter. Ash not exceeding 5 percent.

Stramonium.—The dried leaves of Datura Stramonium Linné, or of Datura Tatula Linné, (Fam. Solanaceæ), with not more than 10 percent. of stems and other foreign matter. Usually much wrinkled and either loose or more or less matted together; laminæ when entire from 2 to 30 cm. in length, having petioles from 0.5 to 8 cm. in length; inequilaterally ovate, summits acute or acuminate, bases unequal, one side extending from 3 to 12 mm. below the other, margins sinuate, toothed or angled, the teeth being few, acute or acuminate and with rounded sinuses, frequently with numerous circular perforations which may have become filled with cork; upper surfaces dark green, sparsely hairy, especially upon the veins, lower surfaces light green; odor distinct, heavy and narcotic, taste unpleasant, nauseous; stems cylindrical, usually flattened, attaining a length of 30 cm. and a diameter of 7 mm.; longitudinally wrinkled, occasionally with 1 or more deep furrows, light greenish-brown to purplish-brown. Powder: Brownish-green; upon clearing the fragments with hydrated chloral T. S., numerous elliptical stomata are observed, about 0.025 mm. in length, and surrounded usually with 3 neighboring cells; cells of the mesophyll containing numerous small chloroplastids; calcium oxalate either in rosette aggregates, from 0.010 to 0.020 mm. in diameter, or in rod-like crystals, or in the form of sphenoidal micro-crystals; non-glandular hairs few, characteristic, 2- to 4-celled, attaining a length of 0.500 mm., the basal cell about 0.040 mm. in width, some of the cells more or less collapsed, the outer walls with numerous, slight, centrifugal projections; glandular hairs few, with 1- to 2-celled stalks and usually 2- to 4-celled, glandular heads; tracheæ annular or spiral, fragments of the tracheal wall frequently detached. Stem fragments show large annular or spiral tracheæ which occasionally are thickened, with simple or bordered pores and associated with wood parenchyma; fragments with long, narrow, unequally thickened collenchymatous cells; parenchyma with sphenoidal micro-crystals; wood-fibers occasional; bast-fibers absent. Ash not exceeding 20 percent.

Strophanthus.—The dried, ripe seeds of Strophanthus Kombé Oliver, or of Strophanthus hispidus De Candolle (Fam. Apocynaceæ), deprived of the long awn. Lance-ovoid, flattened and obtusely edged; from 7 to 20 mm. in length, about 4 mm. in breadth and about 2 mm. in thickness; externally of a light fawn color with a distinct greenish tinge, silky lustrous from a dense coating of closely appressed hairs, (S. Kombé), or light to dark brown, nearly smooth and sparingly hairy (S. hispidus), bearing on one side a ridge running from about the center to the summit; fracture short and somewhat soft, the fractured surface whitish and oily; odor heavy when the seeds are crushed and moistened; taste very bitter. Under the microscope sections of Strophanthus Kombé show a seed-coat composed of several layers of more or less collapsed, thin-walled cells and from the epidermal layer arise numerous non-glandular hairs, which are from 0.200 to 0.800 mm. in length, usually more or less bent, thin-walled, and slightly lignified at the base; in the raphe occurs a tangentially elongated fibro-vascular bundle having numerous spiral tracheæ; endosperm of from 9 to 30 rows of more or less polygonal cells with slightly thickened walls and containing small aleurone grains, a fixed oil and strophanthin, the latter being colored bright green

upon the addition of sulphuric acid; in the center occur two large plano-convex cotyledons having a distinct epidermal layer, a few fibro-vascular bundles and numerous parenchyma cells containing aleurone grains, a fixed oil and occasionally a small amount of strophanthin. Sections of Strophanthus hispidus resemble those of S. Kombé, the hairs being fewer, the bases of which are more strongly lignified. Powder: Grayish-brown to dark brown; odor distinct; consisting chiefly of thin-walled parenchyma cells and fragments of long, thin-walled hairs, the latter relatively few in S. hispidus; mounts made with hydrated chloral T. S. show oil globules; many of the fragments of the endosperm may be colored greenish upon the addition of sulphuric acid. The tests with iodine T. S., ferric chloride T. S. and mercuric potassium iodide T. S., omitted. Ash not exceeding 5 percent.

Sumbul.—The roots of Ferula Sumbul (Kauffmann) Hooker filius (Fam. Umbelliferæ). In transverse segments, attaining a length of 10 cm. and a diameter of 7 cm.; externally light brown to dark brown, longitudinally wrinkled and showing in the upper portions a smooth, grayish, epidermal layer, occasionally with the short stem-bases attached; fracture short, fibrous, spongy; internally light yellow or brownish-yellow, arrangement of wood irregular and with yellowish-brown or blackish resinous patches frequently extending over the entire ends of the segments; odor peculiar, musk-like; taste bitter and somewhat aromatic. Powder: Grayish-brown; consisting of numerous, irregular, brownish-black fragments and well defined isolated tracheæ, the latter with distinct end-walls, and mostly with reticulate thickenings and from 0.030 to 0.100 mm. in width, occasional fragments of polygonal epidermal cells with yellowish-brown walls; numerous, nearly colorless, yellowish-brown and reddish-brown fragments consisting of a granular substance in which the cellular structure is not well-defined; long, narrow fragments consisting of more or less collapsed leptome or sieve tissue; occasional fragments of well defined parenchyma with a few nearly spherical starch grains from 0.003 to 0.012 mm. in diameter.

Taraxacum.—The dried rhizome and roots of Taraxacum officinale Weber (Fam. Compositæ). Directions for collecting omitted. Cylindrical or somewhat flattened, gradually tapering, usually broken in pieces, from 6 to 15 cm. in length, from 5 to 15 mm. in thickness; externally brown or blackish-brown, longitudinally wrinkled, having numerous root and rootlet-scars; crown simple or branched with numerous leaf-bases showing annulate markings; odor slight or inodorous; taste bitter. Under the microscope sections of the root show a porous, pale yellow wood from 1 to 4 mm. in diameter, surrounded by a light brown bark from 2 to 6 mm. in thickness, the latter composed of concentric layers of laticiferous vessels and sieve tissues, alternating with whitish inulin-bearing parenchyma. The rhizome portions show a small pith. Powder: Light brown; parenchyma cells large, thin-walled and containing irregular masses of inulin; fragments with yellowish-brown laticiferous vessels; tracheæ reticulate; intermediate fibers non-lignified, with irregular, simple and oblique pores. Ash not exceeding 10 percent.

Tragacantha.—The spontaneously dried gummy exudation from the stems of Astragalus gummifer Labillardière, or from other Asiatic species of Astragalus (Fam. Leguminosæ). In flattened, lamellated fragments varying from ribbon-

shaped bands to long and linear pieces, which may be either straight or spirally twisted, and from 0.5 to 2.5 mm. in thickness; whitish to light brown in color, translucent and horny; fracture short, rendered more easily pulverizable by heating to 50° C.; inodorous; taste insipid, mucilaginous. Under the microscope sections made from Tragacanth previously softened in water and mounted in glycerin should show the lamellæ of mucilaginous walls and a few starch grains, the latter being mostly spherical and single, occasionally 2- to 3-compound, the individual grains from 0.003 to 0.017 mm. in diameter and colored blue with iodine. Indian Gum, derived from plants of uncertain origin, upon similar treatment and examination, shows numerous threads of a granular substance, sometimes the hyphæ of a fungus and chains of bacteria, and occasional fragments of a yellowish-brown or reddish-brown color, containing lignified wood-fibers, a few rosette aggregates of calcium oxalate from 0.020 to 0.030 mm. in diameter, and a few spherical starch grains from 0.003 to 0.007 mm. in diameter. Add 1 Gm. of Tragacanth to 50 Cc. of distilled water; it should swell and form a smooth, nearly uniform, stiff, opalescent mucilage and should be free from cellular fragments. Indian Gum upon similar treatment forms an uneven mucilage containing a few reddish-brown fragments which are more apparent and on stirring separate in the form of coarse, uneven strings. Shake 2 Gm. of Tragacanth with 100 Cc. of water until fully swollen and free from lumps, then add 2 Gm. of powdered sodium borate, and shake the mixture thoroughly until the salt is dissolved; the mucilage should not lose its transparency, nor exhibit any change in consistence, and on pouring should not be slimy or stringy, even after standing 24 hours (absence of foreign gums). Boil 1 Gm. of Tragacanth with 20 Cc. of water until a mucilage is formed, then add 5 Cc. of hydrochloric acid and again boil the mixture for five minutes; no pink nor red color should develop (absence of Indian Gum). Powder: Whitish; forming with water a translucent mucilage and exhibiting numerous starch grains from 0.003 to 0.025 mm. in diameter, varying from spherical to elliptical, with occasional 2- to 4-compound grains, many of the grains being swollen and more or less altered, due to the drying of the Tragacanth before powdering. Powdered Indian Gum shows numerous fragments of lignified vegetable tissue. Ash not exceediing 3.5 percent.

Triticum.—Usually cut in pieces from 4 to 12 mm. in length and from 1 to 2.5 mm. in diameter; externally light yellow or yellowish-brown, longtiudinally furrowed, smooth, shiny, nodes with circular leaf-scars, a few root-scars and occasional slender roots; fracture tough, fibrous; internally lemon-yellow and with a large, hollow pith; odor slight, aromatic; taste sweetish. Roots filiform, irregularly branching, attaining a length of 5 cm. and not more than 0.5 mm. in thickness, light brown or yellowish brown, frequently covered with long root-hairs. Under the microscope, transverse sections show a single layer of strongly lignified epidermal cells; a hypodermis of 3 to 6 rows of more or less polygonal cells with strongly lignified walls; a cortex of 10 to 16 rows of thin-walled parenchyma cells, occasionally with nearly spherical starch grains about 0.005 mm. in diameter, or with irregular masses of a more or less soluble carbohydrate; among the parenchyma cells and near the hypodermis occur small, widely separated fibro-vascular bundles each with a closed sheath of sclerenchymatous fibers;

an endodermis, the lateral and inner walls of the cells being moderately thickened, strongly lignified and somewhat porous; several layers of sclerenchymatous fibers immediately inside the endodermal ring, in which are embedded an interrupted circle of collateral fibro-vascular bundles having large tracheæ; adjoining these are usually 8 to 10 rows of parenchyma cells with a few fibro-vascular bundles and a pith in which the parenchyma cells are more or less broken or absent. Powder: Light yellowish; consisting of irregular, lignified fragments, numerous fragments showing tracheæ with annular or spiral thickenings or marked with simple pores and associated with long, narrow, rather thin-walled, strongly lignified, sclerenchymatous fibers; fragments of epidermis made up of cells rectangular in outline, the longer walls considerably thickened, strongly lignified and marked with numerous transverse pores; ends of epidermal cells usually separated from each other by a very narrow cell with thin walls and few pores; numerous fragments of parenchyma rectangular in outline and with thin, porous walls. Ash not exceeding 3 percent.

Ulmus.—Usually in bundles consisting of flat, oblong pieces 30 cm. in length, from 10 to 15 cm. in width; outer surface of a light brown or buff color with occasional dark brown patches of adhering cork, longitudinally striate and with detached bundles of bast-fibers, and colored blackish upon the addition of a very diluted iodine T. S.; inner surface light yellowish-brown nearly smooth and finely striate, only slightly darkened upon the addition of a very diluted iodine T. S.; fracture fibrous with projecting bast-fibers, the broken surface porous, due to the large mucilage cells; odor distinct; taste mucilaginous. Powder: Very light brown; consisting mostly of fibrous fragments, and a finely granular portion made up of small starch grains, the latter being immediately colored bluish-black upon the addition of iodine T. S.; starch grains mostly spherical or more or less polygonal, usually about 0.003 mm. in diameter, but also attaining a diameter of 0.025 mm.; bast-fibers very long, about 0.020 mm. in diameter, with rather thin, slightly lignified walls; calcium oxalate in monoclinic prisms, mostly in crystal-fibers, the individual crystals from 0.010 to 0.025 mm. in diameter; fragments of large mucilage cells with adhering starch grains. Macerate 1 part of powdered Ulmus with 40 Cc. of distilled water for an hour and filter; the filtrate should be of a rather thick, mucilaginous consistence.

Uva Ursi.—The drug may include not more than 5 percent, of stems and other foreign matter. Usually more or less entire, laminæ obovate or oblong, spatulate, from 12 to 30 mm. in length, 5 to 13 mm. in breadth; summits obtuse or rounded; margins entire, slightly revolute; bases cuneate, tapering into short, stout petioles; upper surfaces dark green, glabrous and shiny, finely reticulate; under surfaces yellowish-green and slightly pubescent, especially on the midribs; coriaceous; fracture short; odor aromatic, tea-like; taste astringent and somewhat bitter. Powder: Olive green; consisting of irregular fragments; epidermal cells polygonal, those of the lower surface showing broadly elliptical stomata about 0.035 mm. in length, surrounded by 5 to 8 neighboring cells; cells of mesophyll with chloroplastids and frequently irregular masses of a carbohydrate; fragments of fibro-vascular bundles with spiral tracheæ associated with narrow, strongly lignified sclerenchymatous fibers and frequently also with crystal-fibers

showing monoclinic prisms, from 0.006 to 0.015 mm. in diameter; numerous fragments made up of cells having a yellowish-brown content which are colored a bluish-black upon the addition of ferric chloride T. S. Add 0.100 Gm. of powdered Uva Ursi to a watch crystal, cover with another watch crystal and gently heat the powder; a crystalline sublimate should be formed consisting of long rods and feather-like aggregates which polarize light with a brilliant play of colors. Macerate 1 Gm. of powdered Uva Ursi with 10 Cc. of boiling water, shake the mixture occasionally until cold and then filter it; the filtrate should yield a grayish-purple precipitate upon the addition of a few drops of ferrous sulphate T. S.

Valeriana.—Rhizome upright, from 2 to 4 cm. in length, and from 1 to 2 cm. in diameter, usually cut longitudinally into 2 to 4 pieces; externally yellowish-brown or dark-brown, upper portion with stem-bases and frequently with a short horizontal branch or stolon, and from the outer surface arise numerous, slender, brittle roots; fracture of rhizome short and horny, internally light brown, with a thick bark and narrow central cylinder; odor pronounced, of valeric acid, becoming stronger upon aging; taste sweetish, camphoraceous and somewhat bitter. Under the microscope transverse sections of the root show a single epidermal layer of papillose cells, some being modified to root hairs; a hypodermal layer containing some secretion cells with suberized walls and in which are usually numerous small, oily globules and occasionally small prismatic crystals; cortical parenchyma, the cells filled with starch, some of the cells near the hypodermis containing a few oil globules; an endodermis of thin-walled cells surrounding a pericambium; a central cylinder with usually 3 to 5 fibro-vascular bundles; tracheæ with simple and bordered pores. Older roots show a large pith of starch-bearing parenchyma, a secondary thickening in the fibro-vascular bundles and a periderm of a few layers of cells. Sections of the rhizome show a thin periderm, a cortical parenchyma with scattered fibro-vascular bundles, a layer of altered cells of the endodermis, numerous, more or less twisted, collateral, fibro-vascular bundles and a large pith. Powder: Light brown to grayish-brown; starch grains numerous, from 0.003 to 0.020 mm. in diameter, spherical, plano-convex, polygonal, 2- to 4-compound and each usually with a central cleft; tracheal fragments, the walls having simple and bordered pores or scalariform and reticulate thickenings, accompanied by narrow sclerenchymatous fibers, the walls being thin, porous, and strongly lignified; occasional fragments of epidermis with root hairs, and fragments of cork. Ash not exceeding 20 percent.

Vanilla.—Yielding not less than —— percent of vanillin. Pods linear, flattened, from 15 to 35 cm. in length and from 5 to 9 mm. in breadth; summits terminating in flat circular scars; gradually tapering, more or less bent and curved or hooked at the bases, or in the Tahiti variety, broad in the middle and tapering towards either end, the base closely resembling the summit; externally blackish-brown, longitudinally wrinkled, moist-glossy, and occasionally with an efflorescence of vanillin in the form of acicular crystals or monoclinic prisms; frequently with narrow, elliptical or irregular, more or less wrinkled, dark-brown patches of cork; occasionally split into three parts near the tip; flexible and tough, 1-locular, containing a blackish-brown pulp and numerous blackish-brown seeds; the latter being flattened, irregularly triangulate or nearly

circular in outline, recticulate and varying from 0.250 to 0.300 mm. in diameter; odor and taste characteristic and very agreeable. Under the microscope transverse sections of the pods show an epidermis with a somewhat thickened outer cuticularized layer having occasionally rounded or conical masses of the excretion of a gum-like substance; a layer of collenchyma of 1 or 2 rows of cells; a thick sarcocarp composed of parenchyma cells in which are embedded an interrupted circle of fibro-vascular bundles; the parenchyma cells are deeply undulate in outline, and usually contain a thin protoplasmic layer enclosing numerous oily globules or may possess bundles of raphides of calcium oxalate, the individual crystals varying from 0.200 to 0.400 mm. in length; some of the parenchyma cells are specially modified and distinguished by their somewhat thickened walls with long, oblique, slit-like pores or the thickening may extend in the form of broad, spiral bands; in the fibro-vascular bundles the phloem is central, being more or less surrounded by a few tracheæ, the walls possessing slit-like pores or spiral thickenings, and at the outside of the bundle is a closed circle of sclerenchymatous fibers, the walls being rather thin, strongly lignified, provided with numerous, transverse, simple pores, the outer wall of the outer row of fibers being irregular or sinuate; from the inner walls of the endocarp arise the placentæ bearing numerous brownish-red or blackish seeds, otherwise from the cells of the endocarp arise numerous long, nearly straight hairs, the ends being rounded, the hairs being more or less matted together by a gummy or resinous mass in which some of the seeds are held; in mounts made in hydrated chloral T. S. or potassium hydroxide T. S., the immature, brownish-red seeds show a deeply reticulate seed-coat, the cells being of an oblong-polygonal form in surface view. Place a few of the crystals, occurring as an efflorescence on the fruit, on a microscopic slide or watch crystal and add a drop of phloroglucinol T. S. and hydrochloric acid; the solution should immediately acquire a carmine-red color (distinction from benzoic acid). Diluted alcohol extractive, not less than 12 percent. Ash not exceeding 6 percent.

Veratrum Viride.—The dried rhizome and roots of Veratrum viride Aiton, (Fam. Liliaceæ), known in commerce as American Hellebore, with not more than 5 percent. of stems and other foreign matter. Rhizome upright, obconical, usually cut longitudinally into 2 to 4 pieces, from 2 to 7 cm. in length, from 1.5 to 3 cm. in diameter, externally light brown to dark brown or brownish-black, frequently bearing at the summit numerous, closely arranged, thin leaf-bases, otherwise rough and wrinkled; somewhat annulate from scars of bud-scales and bearing in the outer portion numerous roots, the lower part more or less decayed; fracture hard and horny; internally yellowish or grayish-white, marked with numerous, irregular fibro-vascular bundles; inodorous but sternutatory; taste bitter and acrid. Roots: Nearly cylindrical, from 3 to 8 cm. in length, 1 to 3 mm. in diameter, externally light brown to yellowish-brown, deeply transversely wrinkled; fracture short, bark whitish, very thick, enclosing a porous central cylinder. Powder: Grayish-brown to dark brown, strongly sternutatory; starch grains numerous, from 0.003 to 0.020 mm. in diameter, spherical or ellipsoidal, single or 2- to 3-compound, the individual grains being often swollen or otherwise more or less altered; calcium oxalate in raphides, from 0.015 to 0.150 mm. in length; fragments with tracheæ, the walls being more or

less strongly lignified and marked with scalariform or reticulate thickenings, frequently containing a lemon-yellow substance and associated with narrow, slightly lignified, porous, sclerenchymatous fibers; reddish-brown or brownish-black cork fragments occasional.

Viburnum Opulus.—The dried bark of Viburnum Opulus Linné (Fam. Caprifoliaceæ), with not more than 5 percent. of wood and other foreign matter. In strips, or occasionally in quills or chip-like fragments, the bark attaining a thickness of 3 mm.; outer surface of the thinner pieces of a light gray color with crooked, longitudinal, purplish-brown stripes and very small brown lenticels, the thicker pieces purplish-red or occasionally blackish, except when very young, and more or less finely fissured or thinly scaly; inner surface varying in color from yellowish to rusty-brown, with very short oblique striæ, except where the outer wood layer adheres; fracture short and weak, the fractured surface mostly whitish, varying to pale brown in the inner layer, rusty-brown in the outer layer covering green, tangential, phelloderm plates; odor strong and characteristic; taste mildly astringent and decidedly bitter. Under the microscope sections show an outer corky layer, of 5 to 25 rows of cells, the walls nearly colorless, frequently thickened on the inner surface, individual cork cells from 0.015 to 0.045 mm. in radial diameter and from 0.030 to 0.075 mm. in tangential diameter; outer bark of about 10 rows of cells containing a brownish-yellow, amorphous substance, small starch grains or chloroplastids, medullary rays 1 to 2 cells in width, usually not more than 1 cell wide, inner bark with occasional groups of bast-fibers composed of 1 to 10 cells, the walls being very thick, non-lignified, lamellated and finely porous; adhering wood with large tracheæ having scalariform or reticulate thickenings, and being surrounded by wood-fibers with thick lignified walls; starch grains, mostly in cells of parenchyma and medullary rays, either single or compound, the individual grains not exceeding 0.006 mm. in diameter; calcium oxalate in rosette aggregates, from 0.015 to 0.040 mm. in diameter; numerous fragments of parenchyma cells, the lumina filled with a reddish-brown amorphous substance. The bark of Acer spicatum Lamarck (Fam. Aceraceæ), is distinguished by the smaller cork cells with very thick walls, the individual cells from 0.006 to 0.008 mm. in radial diameter and about 0.020 mm. in tangential diameter, medullary rays from 1 to 3 cells in width, mostly 2 to 3 cells wide; bast-fibers numerous, in tangential groups, calcium oxalate in monoclinic prisms, chiefly in the outer cortex, the individual crystals being from 0.010 to 0.040 mm. in length, smaller crystals being associated with the bast-fibers in the inner bark. Powder: Light grayish-brown, consisting of irregular fragments; cork cells polygonal, with thin, colorless walls; parenchyma with rosette aggregates of calcium oxalate, from 0.010 to 0.040 mm. in diameter; starch grains very small and mostly in parenchyma cells; fragments of parenchyma containing a brownish-yellow amorphous substance; occasional tracheal fragments associated with lignified wood-fibers. The powder of the bark of Acer spicatum shows numerous prismatic crystals of calcium oxalate, from 0.010 to 0.040 mm. in length, and groups of bast-fibers with adjoining crystal-fibers.

Viburnum Prunifolium.—The bark may include not more than 5 percent. of wood and other foreign matter. In irregular, transversely curved or quilled

pieces, from 1.5 to 6 cm. in length, from 0.5 to 1.5 mm. in thickness; outer surface grayish-brown, or where the outer cork has scaled off, brownish-red, longitudinally wrinkled; inner surface reddish-brown, longitudinally striated; fracture short but uneven, showing in bark which is young or of medium thickness a dark brown cork, a brownish-red outer cortex, and a whitish inner cortex in which are numerous light yellow groups of sclerenchymatous tissues; odor slight; taste distinctly bitter and somewhat astringent. Powder: Dark brown; stone cells numerous, large, often elongated, thick-walled and strongly lignified; bast-fibers few; crystals of calcium oxalate from 0.015 to 0.035 mm. in diameter, occurring mostly in rosette aggregates, occasionally in crystal-fibers; monoclinic prisms of calcium oxalate few.

Zanthoxylum.—The dried bark of Zanthoxylum americanum Miller, known in commerce as Northern Prickly Ash Bark, of Zanthoxylum Clava-Herculis Linné, known in commerce as Southern Prickly Ash Bark (Fam. Rutaceæ). Northern Prickly Ash Bark: In transversely curved fragments or quills, from 2 to 15 cm. in length; bark from 0.5 to 2 mm. in thickness; outer surface light gray to brownish-gray with grayish patches of foliaceous lichens bearing numerous small black apothecia; longitudinally wrinkled and with numerous whitish lenticels, the cork occasionally abraded showing the yellowish or orange colored inner bark; inner surface yellowish-white, finely longitudinally striate and usually with numerous, bright, shining crystals; fracture short, uneven; odor slight, taste bitter, acrid, becoming pungent. Under the microscope transverse sections of Northern Prickly Ash Bark show an outer corky layer consisting of 4 to 20 rows of cells, the tangential walls being strongly thickened and lignified, a layer of collenchyma composed of 8 to 10 rows of tangentially elongated cells, with very thick walls and containing plastids; a more or less indistinct row of endodermal cells beneath which is an interrupted circle of small groups of primary bast-fibers; the inner bark consists of numerous parenchyma cells among which are included large oil secretion reservoirs, separated by medullary rays which are mostly one-cell in width; the parenchyma cells as well as the oil secretion reservoirs contain numerous colorless oily globules. Scrapings from the inner surface show numerous rod-shaped crystals and flat prisms from 0.015 to 0.250 mm. in length, which polarize light with a display of bright colors. Southern Prickly Ash Bark: In transversely curved or irregular, oblong flattened pieces, or in quills, from 2 to 40 cm. in length, bark from 1 to 4 mm. in thickness; outer surface light gray to brownish-gray marked by numerous large barnacle-shaped projections of cork from 0.5 to 3.5 cm. in thickness, otherwise with numerous grayish patches of foliaceous lichens, bearing numerous blackish apothecia, and numerous, elliptical lenticels; inner surface light yellowish-brown to olive brown, obscurely longitudinally striate and free from crystals, odor and taste as in Northern Prickly Ash Bark. Under the microscope transverse sections of Southern Prickly Ash show a strong development of lignified cork occurring in the form of rings, the successive layers being separated by several rows of narrow tabular cells strongly thickened on the tangential walls; a thin layer of collenchyma followed by the other tissues of the primary cortex and consisting of small groups of rather large stone cells and occasional, scattered groups of bast-fibers and parenchyma; the inner bark consists of parenchyma,

a more or less indistinct leptome or sieve tissue and among which are numerous large, light yellowish oil secretion reservoirs, medullary rays from 1 to 2 cells in width; and occasional groups of stone cells and bast-fibers; starch grains numerous, nearly spherical, from 0.002 to 0.010 mm. in diameter, and occurring in the parenchyma cells and medullary rays; calcium oxalate chiefly in monoclinic prisms from 0.010 to 0.025 mm. in diameter, occurring in crystal-fibers and in parenchyma cells of the primary cortex. Powder of Zanthoxylum: Light grayish-brown, consisting mostly of irregular fragments; cork cells nearly colorless and strongly lignified fragments of parenchyma containing either small starch grains, oily globules or monoclinic prisms of calcium oxalate; stone cells in small groups with thick, colorless walls contain frequently a reddish-brown content, bast-fibers few and non-lignified. In the Northern Prickly Ash, the stone cells and calcium oxalate crystals are usually absent and the fragments of cork relatively less numerous.

Zingiber.—The outer cortical layer may be either partially or completely removed. Jamaica Ginger: Rhizomes free from the outer corky layers, in horizontal, laterally compressed, irregularly branched pieces, 4 to 16 cm. in length, and from 4 to 20 mm. in thickness; externally light brown, longitudinally striate, ends of the branches with depressed stem scars; fracture short-fibrous, mealy and resinous; internally yellowish to light brown, cortex thin, endodermis, a thin yellow layer enclosing a large central cylinder with numerous groups of fibro-vascular bundles and yellowish oil cells; odor agreeably aromatic; taste aromatic and pungent. African Ginger: Rhizomes with cork partly removed on the flattened sides, the patches without cork smooth and of a light brown color, the portions with cork longitudinally or reticulately wrinkled and grayish-brown; fracture short or short-fibrous; internally lemon-yellow or dark bluish with yellowish oil secretion cells and light yellow to reddish-brown resin cells; odor strongly aromatic, taste intensely pungent. Calcutta Ginger: Rhizomes resembling the African Ginger, the branches or "fingers" being somewhat larger, and with a considerable proportion of shriveled pieces; externally grayish-brown or grayish-blue; fracture short and mealy, or horny; internally light yellow or light brownish-yellow with numerous yellowish oil cells and yellowish-brown resin cells; odor aromatic; taste starchy and strongly pungent. Calicut Ginger: Rhizomes resembling African Ginger, more of the periderm being usually removed; externally more or less uniformly light brown; fracture short or short-fibrous and mealy; internally light or brownish-yellow with numerous yellowish oil and resin cells; odor aromatic; taste very pungent. Cochin Ginger: Rhizomes with most of the corky layer removed on the flattened sides; externally light brown to grayish-yellow; fracture short and mealy; internally yellowish-white with numerous yellowish oil cells and brownish-red or blackish resin cells; odor aromatic; taste pungent but not so persistent as in the African variety. Japanese Ginger: Rhizome somewhat resembling Cochin Ginger but usually with a thin coating of lime; externally nearly smooth or slightly wrinkled and of a whitish color; fracture short and very mealy; internally varying from a yellowish-white to light brown and with numerous brownish-red resin cells; odor aromatic; taste pungent. Powder: Light yellow, or light brown to dark brown; starch grains numerous and varying greatly in the different varieties, in form

and size being nearly spherical, ovoid, ellipsoidal or pear-shaped and frequently with a characteristic beak, usually from 0.005 to 0.040 mm., occasionally from 0.045 to 0.060 mm., in long diameter; sclerenchymatous fibers long, thin-walled, non-lignified, with oblique pores, and distinctly undulate on one side; oil secretion cells with suberized walls and containing a light yellowish or yellowish-brown, oily substance; cork cells absent in the Jamaica variety. Non-volatile ether extract not less than 2 percent. Alcoholic extract not less than 4 percent. Ash not exceeding 8 percent.

SOME REFORM MEASURES FOR THE A. PH. A.

The Association Has Grown So Fast That Reorganization is an Imperative Necessity—Particularly is This True of the Annual Conventions, Which are in Need of More System and Method.

HARRY B. MASON, DETROIT.

The time has come for the American Pharmaceutical Association to undergo a more or less radical reorganization. This statement does not imply that the A. Ph. A. has lost its vitality and is in need of fresh energy. Not at all. On the contrary, indeed, the trouble arises from too much energy instead of too little, and what is needed is that this energy, in its manifold manifestations, shall be harnessed up and co-ordinated in a more intelligent manner. This is particularly true of the annual meetings.

The fact of it is, the A. Ph. A. has undergone a great development during the last ten years. It has spread out in many directions. It is like a growing boy whose original suit of clothes has been lengthened in the legs, extended in the arms, widened in the seat, and enlarged here and there until the result is somewhat grotesque. What is required is a new suit of clothes, cut to fit the A. Ph. A. in its present proportions.

The Confusion at Nashville. The situation at Nashville last August was one of confusion worse confounded. There were the seven regular sections of the Association, each holding two or three sessions. There was the annual meeting of the National Association of Boards of Pharmacy with four or five sessions. There was the annual meeting of the Conference of Pharmaceutical Faculties There was the joint conference of the latter two bodies and the section on education and legislation of the A. Ph. A. The Revision Committee of the U. S. P. seized upon the occasion to hold two or three meetings. The Revision Committee of the N. F. did precisely the same thing. The Pharmaceutical Syllabus Committee met every night from 9:30 until 12 or 1 in an effort to complete the second edition of the book. The new House of Delegates of the A. Ph. A., organized the year before, held three sessions, and its Committee on Resolutions one or two in addition. The new Section on Pharmacopœias and Formularies held two

sessions, and the new Women's Section three. The Council met every morning at 9, and the groups of alumni of the various pharmacy schools and colleges grasped the opportunity to have meetings, luncheons and dinners in behalf of their alma maters. Besides all of which there were meetings galore of an indefinite number of committees of one kind and another.

As if all this were not enough, a proposition was advanced to create still another section of the A. Ph. A.—a section on materia medica and pharmacognosy. With it all there was no let-up in the work from 9 o'clock in the morning until 1 or 2 o'clock the next morning. Everybody was tired out. Everybody was more or less befuddled by the multiplicity of business.

The Need for a Pruning Knife. Now what ought to be done?

There are several things to do by way of simplifying and improving the annual conventions, and what I shall have to say will touch upon this phase of the subject alone. The first thing is to get a sharp pruning knife and cut out a lot of things from the meetings that do not belong there. Some of these things can well be dispensed with entirely. Others may be taken care of by the *Journal of the A. Ph. A.* and by the Council.

First, as to those things which we can eliminate. What has often been referred to in chaste and elegant language as the "hot air" of the opening session should be tabooed. The day has passed when conventions were such novelties that they had to be called to the attention of state and city officials, and when the members of associations delighted to have welcoming speeches from these notables. Oratory is all well enough, but it bores people to death who go to a convention to transact business and to get something accomplished. Cut it out! Also cut out, or greatly condense, the formal installation of officers at the last session.

Then the standing committees of the A. Ph. A. need some culling. The Committee on the Revision of the Pharmacopœia is useless. The Committee on the Drug Market is obsolete. The Report on the Progress of Pharmacy is a feature of great value and importance, but it ought not to be considered at the annual meeting at all. Print it in a separate volume, or in the *Journal of the A. Ph. A.*, and let it go at that. What can be said about it at the meeting itself is so incomplete that it is of very little value anyway.

There are several committees which are appointed by the Council and which make their reports in the *Journal.* They ought not to take up the time of the Association at the annual convention. If any other report is needed than the one printed in the official organ, let it be rendered to the Council itself. The time of the annual meeting is valuable and precious. It should be husbanded. It should be devoted to business that cannot be attended to by the Council or in the official publication.

Still more in the way of elimination may possibly be done. Some members of the Association think we have gone too far in the creation of separate sections. They would have us return to the days of two or three sections. I do not agree with them. I do think, however, that the proposed Section on Materia Medica and Pharmacognosy should not be established. I think further that the Section on Pharmacopœias and Formularies, created three or four years ago, should be abandoned. Its work can be taken care of elsewhere.

All the other sections, unless it be the one given up to history, should be retained. They are devoted, respectively, to commercial papers, scientific interests, education and legislation, and practical pharmacy and dispensing.

These are all needed. To go any further in the direction of specialization, however, would be folly. The Association isn't big enough, even if there are enough subjects. If we have too many sections, there won't be audiences enough to go around.

Still continuing the subject of elimination, so far as the annual gatherings are concerned, it is at least an open question whether the meetings of the two auxiliary bodies, the National Association of Boards of Pharmacy and the Conference of Pharmaceutical Faculties, should not be held either late the week before, or early the week following, the convention of the A. Ph. A. These bodies add somewhat to the confusion of A. Ph. A. week, and to a certain extent take away from the attendance upon the various sections.

A Rational Program. So much, then, on the subject of elimination. Now for what is left. After all possible eliminations have been made, there inevitably remains a great mass and variety of work. There is no objection to this, *but there is a vital need of classifying and co-ordinating the work intelligently.* It is perfect folly to have a hit-and-miss program that nobody knows anything about, and that keeps people on the jump pretty nearly twenty-four hours every day for six working days.

The first thing to do is to keep the evenings free for rest, recreation, and social intercourse. Condense the work into the morning and afternoon periods. Start the section meetings in the morning at 9 o'clock, or not later than 9:30. In order to do this it will be necessary to have *the Council meet in the evening.* This august body, by prolonging its meetings so far toward noon every morning, delays and postpones the regular work of the sections, and nothing seems to me more important than that this evil should be eliminated. By starting the sections at 9 or 9:30 in the morning, a lot of good work can be done during the hours when people are fresh, unwearied and interested. This would make powerfully for added zest and profit.

But if you permit no section work in the evening, and if you restrict it to the morning and afternoon periods, you practically limit the number of work periods to eight. With five or six sections, each holding two or three sessions, making a total of twelve or fifteen sessions altogether, the present scheme of concurrent meetings will of course have to be retained. To this there is no possible objection. Indeed, the concurrent session idea can perhaps be developed more in the future than it has been in the past. Perhaps it can be extended so far as to condense the period of the annual meeting from six days into three or four, as is done by the American Medical Association. Many people are in favor of such a change.

Co-ordinating the Sections. What is needed, though, is a far better and more perfect co-ordination among the sections. As a man sits in one room, listening to the business of one section, he should know precisely what is going on across the hall or upstairs in other rooms at the same time. This will enable him to hear all that he wants to hear. It will likewise prevent him from being bored

to death in one section when something is going on in another that would hit his particular taste.

There are two ways of accomplishing this co-ordination. In the first place we have never worked out a printed program of the right sort. It ought to be possible to print one united program containing the detailed programs of all the different sections. It ought also to be possible to assign a paper arbitrarily to a definite session, and to its proper place in the program of that session, so that members can know approximately when certain subjects are coming up for attention. To supplement this, however, there should be established a system of blackboards, with two or three hotel "pages," so that the members in any one room would be notified what is simultaneously going on in the other rooms, and kept in touch perfectly with the multifarious work of the association. I am glad that Leonard A. Seltzer, local secretary this year, is going to systematize this blackboard scheme and see what can be done with it at the Detroit meeting in August.

Leave Time for Discussions! With the section work co-ordinated in this way, and with the members kept in touch with what is going on everywhere, it would easily be possible to give each section more sessions and thus provide time for the proper discussion of papers—a thing which has not been practicable now for many years. The discussions are often more important than the papers themselves. If a man only goes to a meeting to hear papers read, he might as well stay home and read them in the drug journals, with pipe and slippers, and with his feet on the mantel.

To recapitulate: If we eliminate from the annual convention what can easily be dispensed with, as suggested in the first portion of this paper, and if we work out a better co-ordination of the work of the different sections, we shall make an enormous improvement in the annual meetings. We shall get rid of what is unessential; we shall enable a member to hear everything that he really wants to hear; and we shall provide time for debate and interchange of opinion.

A Censor Required. At least one other thing is necessary. There should be some censorship exercised over the papers accepted for the different sections. One great objection to increasing the multiplicity of sections is that the different chairmen promptly begin a competition with one another to secure as many papers as possible. It becomes a matter of pride to see how long a list can be secured. The inevitable result is that a large majority of the material is poor and ought never to be prepared at all. Another result is that papers frequently get into the wrong section.

There ought to be some individual or some committee with authority over the different sections. Who can better serve in this capacity than the general secretary? He is really the general manager of the association, and he knows more about its activities than anybody else. I believe that the chairmen of the different sections should report to the general secretary; that he should have the authority of a censor; that he should eliminate papers if he thinks best; that he should re-assign papers if he deems such action necessary; and that he should get up, or have someone else to do so under his supervision, a co-ordinated program of the meeting. He should be general manager of the association in

name and in effect, and he should have all the functions of a general manager of a private corporation.

A Great Past—A Greater Future. Now I do not want to be misunderstood in making these criticisms. I do not want any reader to get the notion that I think the A. Ph. A. is all wrong. On the contrary, the A. Ph. A. is the one great catholic organization in American pharmacy—the one organization acting like a parent to all the others—representing every phase and branch of the calling, and doing foundational work of an indispensable character. It is an association with a great past. It is an association with a still greater future. My only point is that it has outgrown the clothes of a growing youth and now needs the equipment of the adult it has come to be. Particularly are the annual meetings in need of reform if they are successfully, intelligently, and efficiently to handle the vast amount of work undertaken by the association.—*The Bulletin of Pharmacy.*

SYRUP OF FERROUS IODIDE.

W. C. ALPERS, SC. D., CLEVELAND.

There are few preparations in the Pharmacopœia that have given more annoyance and caused more difficulties to the pharmacist than the syrup of iodide of iron. The literature on this syrup, from the first day of its appearance, is very voluminous and hundreds of writers on pharmaceutical subjects in all civilized countries have recommended various methods for its preparation and given direction for its preservation. The history of this syrup, as shown in the various editions of our own Pharmacopœia, demonstrates the gradual development of its understanding.

A liquid preparation of ferrous iodide appears first in the second edition of the U. S. P. (1840) under the name of Liquor Ferri Iodidi. It was made of iron wire and iodine and contained 5 fluidounces of honey in a finished product of 20 fluidounces. In the following edition, the third (1850), the honey was replaced by 12 ounces of sugar, but the preparation was still called a solution. The name syrup appears for the first time in the fourth edition (1860). The formula directs the addition of two troy ounces of iodine to a mixture of 300 grains of iron wire and water, and filtration of the resulting green liquid into simple syrup heated to 212° F. The syrup is to be preserved in well-stoppered two-ounce bottles. Here we see that the value of applying heat is recognized. No change in the formula was made in the fifth edition (1870). In the sixth revision (1880), of the Pharmacopœia, which shows throughout many marked improvements over the preceding ones, weights were replaced by parts and the finished product brought to 1000 parts, which designation afterwards gave way to cubic centimeters. Syrup of ferrous iodide is here described as a syrupy liquid containing 10 percent of ferrous iodide. It is made from 25 parts of iron and 82 parts of iodine. The liquor is filtered into 600 parts of sugar and the

syrup heated to the boiling point, before putting it into small, completely filled and well-stoppered bottles. It is to be kept exposed to daylight. In the seventh revision the iodine is increased to 83 parts and the liquor filtered through a funnel, the lower end of which dips below the surface of the sugar in order to prevent contact with the air. The instructions as to daylight were omitted. Here, too, we find for the first time directions for testing the syrup. In the eighth edition more changes were made. The percentage of ferrous iodide was reduced from ten to five, and two percent of hypophosphorous acid added as a preservative. Fifty grams of sugar are at once added to the aqueous boiling solution of ferrous iodide, before filtering it into the remainder of the sugar, which is to be dissolved by heat. No directions are given as to keeping the finished product.

The history of this syrup in the United States Pharmacopœia, as well as that of all other pharmacopœias, reveals the difficulties that are encountered in its preparation and the various methods employed to overcome them.

No matter how carefully the original ingredients—iron, iodine, water—are selected and tested as to their purity, the reaction between them will not always proceed alike. The pharmacopœias of all nations take notice of this peculiarity. They direct the addition of cold water to check the reaction, and gentle heating to promote the reaction, if necessary. It has never been explained why this different behavior in so simple a preparation should exist. In similar chemical processes a remedy for too violent reaction is sometimes found in the use of a catalyzer and some experiments made in this direction with the solution of ferrous iodide seem to indicate that it could be used here to advantage. I have tried a coil of clear, bright iron wire put in a porcelain dish with the chemicals to be of great service, the reaction proceeding gently and steadily so that neither heat nor cold water were needed. Dr. P. Bohrisch, of Dresden, in a recent article on this subject, recommends the use of a bright iron spatula to be held in the solution during the reaction.

That the stability of the syrup is increased by heating, was soon recognized. Hager, in his handbook, recommended it long before the pharmacopœias adopted it. Hager's idea was that the heat would invert some of the sugar, and that invert sugar was more stable than ordinary sugar. Following this suggestion O. Linde recommended the use of invert sugar, and Scheling claimed that glucose was still better. This last claim was explained by others as owing to the small amount of sulphurous acid always present in glucose. This again led to the addition of sulphurous acid in the form of sodium bisulphite. A number of other preservatives were also tried. Constatin-Tamasici, a noted French pharmacist, recommended the addition of six drops of lactic acid to one litre, while others preferred tartaric acid. Hausmann recommended hypophosphorous acid, a suggestion that had been made before by J. F. Judge in the American Journal of Pharmacy in 1876. The addition of 5 percent of pure alcohol is also mentioned in French journals as a good means of preserving the syrup. The latest chemical to be recommended is citric acid. Extensive experiments were made with it and at present three pharmacopœias, the Swiss, the Austrian and the Belgian, direct citric acid to be added in quantities of 0.5 to 1 percent.

Besides the preservatives the mode of keeping the finished syrup was carefully examined. Here also the investigators arrived at different results. Some recommended dark bottles, others light ones; some kept their product in dark closets, others exposed it to direct sunlight, and again others to diffused light. The directions in successive editions of nearly every pharmacopœia sufficiently show the tendency of the respective time and the changes that took place in the minds of the revisors.

In all these efforts to find the proper preservative for the syrup of iodide of iron the object in view was the preservation of color and taste of the syrup when kept on the shelves of the shops. But this is not sufficient, as has often been pointed out. If a physician orders two ounces of the syrup to be taken three times a day in doses of ten drops, there are about 100 doses in the bottle and the medicine will last longer than a month, during which time the color will often change. Every dispenser has had the experience that a customer will return with a bottle containing this syrup and ask if the changed color is an indication of deterioration. Our efforts should therefore be directed to prepare a syrup of iodide of iron that will keep not only on the shelves of the shop, but also in the hands of the patient when the bottle is opened several times a day.

Recognizing the difficulties of preparing and preserving this syrup the manufacturers of pharmaceuticals have tried to relieve the pharmacists of this care (!) by preparing a concentrated solution of the iodide of iron, from which the syrup of ferrous iodide is made by admixture with simple syrup. The remedy would be a good one provided a solution can be made that will keep. Experience, however, shows that these solutions, after opening the containers a few times, are subject to the same discoloration as the syrup.

When I was entrusted with the chairmanship of the sub-committee on syrups and elixirs for the 9th revision of our Pharmacopœia I commenced a series of experiments with a number of syrups, among others the syrup of ferrous iodide. More than sixty samples of the latter were examined. Some were bought from reputable druggists, some from manufacturers, some were made from solutions, but the majority were prepared according to the formulæ of various pharmacopœias. Every method known was employed. Granulated sugar, lump sugar, invert sugar and glucose were tried; also filtering the solution cold and hot into sugar or syrup. Heating the solution and heating the finished product was resorted to. All the recommended preservatives were tried. Some bottles were opened 3 times a day for a month and 5 to 10 drops taken out. Tests were made for free iodine, at the beginning of the work, after 3 months and after 6 months. The amount of ferrous iodide present was determined by the silver nitrate method of the Pharmacopœia. All observations were carefully noted.

The results of this long series of observations are as follows:

The presence of a catalyzer during the preparation of the solution is desirable. A coil of bright iron wire or a bright iron spatula may be used.

The solution should be brought to the boiling point and the sugar dissolved in it at once by the aid of heat.

It is immaterial whether the finished syrup is again boiled or not.

The finished syrup should be kept in small, well stoppered, completely filled bottles in ordinary daylight. The color of the glass is immaterial.

Neither invert sugar nor glucose are preferable to granulated sugar.

Syrup of iodide of iron made from the best ingredients does not need any preservative to remain perfect on the shelves of the shop. The samples with hypophosphorous acid kept equally well as those without it; but its addition is neither an advantage nor a necessity.

After dispensing, or when the bottles are opened several times a day, citric acid is the best preservative; but its power seems to be restricted to a limited time, after which discoloration takes place very rapidly.

When the pale green color of the syrup has changed to lemon yellow or light brown, the loss of ferrous iodide is very small, ranging from one-fourth to three-fourths of one percent of the required quantity.

On the strength of these results the conclusion may be drawn that syrup of iodide of iron, when prepared from pure chemicals, does not need any preservative. When dispensed in bottles that will be opened several times a day, the addition of one-half of one percent of citric acid is advisable, provided the prescribed quantity will be consumed within thirty days. A slight change of the color during the prescribed time of taking it is negligible.

ASH CONTENT OF CRUDE DRUGS.

E. L. MAINES, PHAR. D.

Ash standards of crude drugs have been given more consideration of late years than formerly and are now included in the United States Pharmacopœia and the more widely known foreign pharmacopœias. Ash limitations were first introduced in the second edition of the German Pharmacopœia, published in 1882 and in the United States Pharmacopœia of 1880.

On account of the difficulty in securing reliable data on these ash standards, an investigation was begun in our laboratory with the object of securing suitable standards and ascertaining the actual variation in ash content of the various drugs.

These determinations were made upon the commercial air dried drugs after having been reduced to a fine powder (No. 60 if possible) and the sample incinerated until the residue was free from carbon, employing such means as to insure perfect combustion. The sample was placed in a tared porcelain crucible and at first, heated gently in a Bunsen flame, the temperature being gradually increased, or a blast lamp employed, until the residue ash contained no unconsumed carbon.

The ash standards as set by the various pharmacopœias are not all that could be desired. Most striking variations may be seen in ash standards for the same drug in different pharmacopœias as was clearly shown in a paper by M. I. Wilbert (Jour. A. Ph. A., May, 1912) and in which he gives a table of ash limitations for the recently published pharmacopœias.

The importance of ash examinations in determining the quality of crude drugs should not be overlooked as they form one of the best tests as to quality, uniformity, etc.

The Report of the Committee on Drug Market for 1913 contains ash determinations for nearly all of the crude drugs reported.

The ash standards of the various pharmacopœias and other authorities, are given as a means of comparison with the results reported.

TABLE SHOWING ASH CONTENT OF CRUDE DRUGS.

Drug.	*Physical Condition.*	*Ash %.*	*Remarks.**
Acacia No. 1	powdered	1.73 to 2.53	Ph. G., Ph. Hung,. Ph. Svec., Ph. Belg., 5%; Ph. Ital., Ph. Helv., Ph. Ndl., U. S. P., 4% ash.
Acacia No. 2	powdered	2.19 to 2.82	
Acacia No. 2	granular	2.36	
Aconite Root (German		3.80 to 5.98	
Aconite Root	powdered	3.52	
Althea Root	powdered	8.18 to 10.35	K., 5%; Ph. Belg., 7½%; Ph. Aust., Ph. Helv., 6%; Ph. Ndl., 7%.
Aloes, Socotrine	powdered	4.63 to 8.95	K., 4%; Ph. G., Ph. Aust., 1%; Ph. Fr., Ph. Helv., Ph. Ndl., 1.5%; Ph. Ital., 2% ash.
Agaric, White	granular	1.29	
Angelica Seed (European)	granular	7.16 to 7.35	
Asafœtida	powdered	8.73 to 16.79	U. S. P., Ph. G., 15%; Ph. Ital., Ph. Fr., Ph. Svec., Ph. Aust., Ph., Belg., Ph. Ndl., 10%; Ph. Helv., 20%.
Avena Sativa	granular	0.4	U. S. D., 2.15% ash.
Balm Gilead Buds	granular	1.84 to 2.41	
Belladonna Leaves	granular	6.25 to 13.30	Ph. G., Ph. Helv., Ph. Aust, 15% ash.
Berberis Aquifolium	ground	2.85 to 3.20	
Berberis Aquifolium	granular	2.64 to 2.78	
Berberis Aquifolium	powdered	2.07 to 2.54	
Black Haw, Bark of Root	granular	11.54 to 12.64	
Black Haw, Bark of Root	ground	12.38 to 13.41	
Black Haw, Bark of Root		12.81	K., 10% ash. Sample very dirty, containing much silicious matter.
Blood Root	granular	5.27 to 7.42	
Blood Root	ground	7.23	
Blue Cohosh	granular	6.78 to 7.84	
Blue Flag Root	granular	3.14	
Broom Corn Seed	whole sd.	2.58	
Buchu, Long		3.84 to 4.60	
Buchu, Short	ground	4.75	
Buchu, with Stems	granular	5.24	U. S. D., 4.40% to 4.69% ash.
Buckthorn Bark	granular	5.15 to 5.84	K., 5 to 6% ash.
Burdock Root (Foreign)	granular	4.20 to 10.45	
Calamus Root	granular	2.75 to 3.81	
Cannabis (African)	granular	18.80	
Cannabis Indica	powdered	14.00 to 20.89	
Cantharides, Russian	powdered	6.61	U. S. P., Ph. G., Ph. Helv., Ph. Aust., 8%; Ph. Ndl., 9%; Ph. Ital., 7% ash.
Capsicum	powdered	6.86 to 6.96	
Capsicum	granular	5.10 to 6.19	Ph. B., Ph. G., Ph. Helv., Ph. Aust, 6½%; Ph. Hung., 5% ash; K., 4 to 6% ash.
Caraway Seed (Dutch)	granular	5.93 to 6.82	U. S. P., Ph. Helv., Ph. G., 8%; Ph. Aust., 7% ash.
Cardamom	granular	4.92 to 5.47	Ph. Aust., Ph. Ndl., 8%; Ph. Helv., 10% ash.
Cardamom	powdered	5.04 to 7.49	U. S. P., 4% ash.
Cascara Sagrada	powdered	4.70	K., ash 7%; Ph. G., 6%; Ph. Ndl., 10% ash.
Catnip Herb	granular	11.09	
Celery Seed	granular	7.25 to 10.22	
Chamomile Flowers (Hung.)	granular	2.00 to 2.64	
Charcoal (Willow)	powdered	6.21	Ph. G., 5%; Ph. Ital., Ph. Helv., Ph. Ndl., 2% ash.
Cinchona Bark, Red	granular	9.30 to 15.07	
Cinnamon, Saigon Quills	powdered	3.06 to 5.03	

Drug.	*Physical Condition.*	*Ash %.*	*Remarks.**
Cinnamon, Saigon Quills	granular	3.12 to 4.53	
Cinnamon Bark (China)	granular	1.83	
Cinnamon Bark (China)	powdered	2.73	
Clover Tops, Red	granular	8.45 to 12.60	
Cloves	powdered	5.25 to 5.54	U. S. P., Ph. Aust., Ph. G., 8%; Ph. Helv., 7%; Ph. Ndl., 6% ash.
Coca Leaves (Truxillo)	granular	6.22 to 12.07	
Cochineal	powdered	3.69 to 13.15	Labeled—For technical use only.
Cochineal, Silvered	whole bug	6.86	U. S. P., Ph. Helv., 6% ash.
Cochineal, Black	whole bug	7.01	
Colchicum Seed	granular	2.23 to 2.51	K., 2½% ash.
Colombo Root	granular	7.87 to 10.87	K., 6%; Ph. Helv., 8%; Ph. Aust., 6% ash.
Corn Silk, Dried	granular	5.38 to 7.61	K., 12% ash.
Cramp Bark	granular	1.45 to 3.50	Cramp Bark so-called.
Cubeb, Berries (Stemless)	powdered	6.03 to 7.87	K., 6%; Ph. G., Ph. Helv., 8%; Ph. Ital., Ph. Aust., 9%; Ph. Ndl., 10% ash.
Cubeb Berries (with Stems)		6.64 to 6.80	
Cubeb Berries	powdered	6.61	
Cudbear	powdered	7.83	Label stated—8 to 10% ash.
Damiana	granular	10.41	
Dandelion Root	granular	3.03 to 15.30	K., 5% ash.
Digitalis Leaves	granular	6.90 to 7.75	
Digitalis Leaves	powdered	11.55 to 11.90	K., 10 to 16%; Ph. Belg., Ph. Helv., Ph. Aust., 10% ash.
Doggrass, German	granular	4.65 to 5.48	
Doggrass	ground	3.94	
Dogwood, Jamaica	granular	9.99 to 11.47	Some samples were very dirty, containing many small pebbles.
Echinacea Root	granular	4.87 to 5.22	
Echinacea Root	powdered	5.86 to 6.05	
Ergot	granular	3.40 to 4.16	K., 4½%; Ph. Ital., Ph. Helv., Ph. Aust., Ph. Ndl., 5% ash.
Euphorbia	granular	8.33 to 21.66	One sample the ash consisted principally of sand.
Fennel Seed (Moravian	granular	7.85 to 8.40	K., 7%; Ph. Helv., Ph. G., Ph. Aust., 10%; Ph. Belg., 12% ash.
Gamboge	powdered	0.82 to 1.21	K., 1 to 3% ash.
Gelsemium Root	granular	2.24 to 2.59	
Gentian Root	granular	2.99 to 2.42	Ph. Aust., 5%; Ph. Helv., Ph. Ndl., 6%; Ph. Belg., 7% ash.
Gentian Root	powdered	4.07	
Ginger, Jamaica	powdered	2.81 to 4.24	N. S. D., 4 to 5% ash.
Ginger, Jamaica	granular	3.31 to 4.01	
Golden Seal Root	granular		Ph. Ital., Ph. Aust., Ph. Helv., Ph. Ndl., 6% ash.
Golden Seal Root	powdered	9.93 to 14.33	
Guarana	powdered	0.89 to 1.18	K., 2% ash.
Guaiac Gum	powdered	3.20 to 4.95	K., not more than 4% ash.
Henbane Leaves	granular	20.45 to *35.32	Ash principally sand. Ph. G., 24% ash.
Hydrangea Root	granular	2.91 to 5.18	
Ipecac, Carthagena		6.21 to 8.05	
Ipecac, Carthagena	powdered	5.44 to 7.83	Ph. Helv., Ph. Ital., 4%; Ph. Aust, 5%; Ph. Ndl., 6% ash.
Ipecac Root	powdered	3.28 to 5.06	
Irish Moss, Bleached	whole	16.61 to 17.64	U. S. D., not more than 17%; K., 10 to 15% ash.
Juniper Berries		3.82	K., 2 to 4% ash.
Juniper Berries	granular	3.17 to 3.19	
Larkspur Seed	powdered	5.00 to 6.42	
Licorice	cuttings	5.18 to 5.62	
Licorice, Spanish	cuttings	2.61 to 6.61	Ph. Helv., Ph. Aust., Ph. Ndl, 6%; Ph. Belg., 7% ash.
Life Root Plant	granular	8.26 to 9.61	
Liverwort Leaves	granular	10.25	

Drug.	*Physical Condition.*	*Ash %.*	*Remarks.**
Lobelia Herb	granular	8.04	
Lycopodium		0.27 to 1.44	U. S. P., Ph. Ndl., 5%; Ph. Belg., Ph. Ital., 4%; Ph. Aust., Ph. Helv., Ph. G., 3% ash.
Manaca	granular	1.34 to 1.82	
Mandrake	granular	5.42	
Manna	sm. flakes	0.62	K., 1.3 to 4%; Ph. G., Ph. Helv., 3%; Ph. Ital, 3½%; Ph. Svec., Ph. Aust., 4% ash.
Musk Root	granular	6.01 to 8.27	K., about 8% ash.
Myrrh Gum	powdered	4.08 to 5.45	K., 5 to 10%; Ph. Ndl., 5%; Ph. Belg., Ph. Aust., Ph. Svec., Ph. Ital., Ph. Helv., 6%; Ph. G., 7% ash.
Nutmeg	powdered	1.83 to 2.63	
Nux Vomica	powdered	1.69 to 2.25	K., 1 to 4%; Ph. Aust., Ph. G., 3%; Ph. Helv., 3½% ash.
Nux Vomica	granular	1.57 to 2.39	
Nux Vomica		2.07	
Opium	powdered	5.84 to 7.37	K., 4 to 8%; Ph. Aust., Ph. Helv., Ph. Ital., 6% ash.
Orange Peel, Dried (Bitter)		3.80	K., ash about 5%.
Orange Peel, Dried (Sweet)		3.72	
Orange Peel, Dried (Bitter)	granular	3.28 to 4.74	
Orris Root	powdered	2.69	
Passion Flower Herb		9.12 to 9.22	
Passion Flower Herb	granular	11.95	Ash consisted principally of sand.
Pepper, Black		3.53 to 4.99	K., ash about 5%.
Peppermint Herb	crushed	12.24	Contained an excess of stems.
Peppermint Herb	granular	12.75	Ash consisted chiefly of silicious matter.
Peppermint Herb		13.07	Ash consisted chiefly of silicious matter.
Pichi Leaves		8.30	
Poke Root	granular	8.74 to 9.89	N. S. D., 8 to 10%; K., 13% ash.
Prickly Ash Bark	granular	6.78 to 7.34	K., ash about 12%.
Pulsatilla Herb	granular	6.60 to 7.83	
Pulsatilla Herb		8.15 to 9.93	
Quassia Chips	granular	2.00 to 2.49	
Red Rose Leaves	powdered	3.27 to 4.06	
Red Saunders	powdered	1.04 to 1.15	
Rhubarb Root	granular	5.93 to 9.21	K., ash about 15%; Ph. Aust., Ph. G., Ph. Ital., Ph. Ndl., 12%; Ph. Helv., 13% ash.
Rhubarb Root	ground	8.44	
Rhubarb Root	powdered	8.66 to 9.74	
Saffron, American	granular	4.52 to 6.98	
Sandalwood	granular	4.20 to 5.76	
Sassafras Bark	ground	43.93	Ash consisted principally of sand.
Sassafras Bark	granular	11.93	
Saw Palmetto Berries (Dried)	granular	1.81 to 2.62	
Saw Palmetto Berries (Dried)	powdered	2.42 to 3.07	
Senega Root	granular	5.04 to 6.97	U. S. P., 7% ash.
Senega Root	ground	6.85	
Senega Root (North Western)		5.04	
Senna, Half Leaf (Alex.)		9.06 to 9.85	K., 10 to 12% ash.
Senna, Half Leaf (Alex.)	granular	10.93 to 12.62	
Senna, Half Leaf (Alex.)	powdered	9.86 to 12.20	Ph. Belg., Ph. G., Ph. Helv., 12%; Ph. Aust., 10%; Ph. Ndl., 8% ash.
Senna, Broken		9.21 to 11.04	
Senna, Broken	powdered	8.96	
Senna siftings		16.82	
Snakewood Bark (Cascara amarga)	granular	7.72	
Spikenard Root	granular	5.93 to 7.78	
Squaw Vine	granular	6.77 to *14.21	One sample the ash consisted principally of sand.

Drug.	*Physical Condition.*	*Ash %.*	*Remarks.**
Squills	granular	3.64 to 6.98	
Squills	powdered	2.29 to 3.23	Sq., 3% ash; Ph. G., 5%; Ph. Aust., 8%; Ph. Helv., 5% ash.
Stillingia Root	ground	5.81	K., 5% ash.
Stillingia Root	granular	4.47 to 5.39	
Stone Root	granular	4.43	
Stramonium Leaves		21.04 to *27.80	Drug adulterated. K., 17%; Ph. G., 20% ash.
Stramonium Herb	granular	14.76 to 18.64	
Tragacanth Gum		2.93	
Tragacanth Gum	powdered	2.85	Sq., ash 2 to 3% rarely exceeds 4%; K., about 3% ash.
Unicorn Root, False	granular	4.54 to 12.20	
Uva Ursi Leaves		3.29	Label stated about 3% ash.
Uva Ursi Leaves	granular	1.44 to 3.13	K., not more than 3% ash.
Valerian Root (Belgian)	powdered	22.04 to 24.14	Ph. Belg., 15%; Ph. Helv., 12%; Ph. Aust., 10% ash.
Valerian Root (Belgian)		18.61	
Vanilla Beans (Mex. Cuts)		0.40	K., ash about 5%.
White Pine Bark	granular	1.09 to 2.04	
Wild Cherry Bark	granular	2.48 to 4.62	
Yellow Dock Root	granular	11.67	
Yerba Santa	granular	5.13	

*Abbreviations:

K.—Kraemer's Botany and Pharmacognosy.
U. S. D.—United States Dispensatory.
N. S. D.—National Standard Dispensatory.
Sq.—Squires Companion of the British Pharmacopœia.
Ph. B.—British Pharmacopœia.
Ph. G.—German Pharmacopœia.
Ph. Belg.—Belgian Pharmacopœia.
Ph. Fr.—French Pharmacopœia.
Ph. Ital.—Italian Pharmacopœia.
Ph. Helv.—Helvetica Pharmacopœia (Swiss).
Ph. Svec.—Swedish Pharmacopœia.
Ph. Ndl.—Netherlands Pharmacopœia.
Ph. Aust.—Austrian Pharmacopœia.
Ph. Hung.—Hungarian Pharmacopœia.

ANALYTICAL LABORATORIES, BRISTOL-MYERS COMPANY, January 30th, 1914.

PHYSICIANS AND CLEANLINESS.

"In an article in the *Southern Medical Journal,* an abstract of which appears in this issue, Dr. Charles Wardell Stiles severely criticises certain physicians with whom he has come in contact for a want of cleanliness in their offices, and for lack of careful observance of the rules of general hygiene. He says that inasmuch as physicians constantly advocate health legislation, they should be prepared to set a proper example of cleanliness for the laity. His contention is supported by numerous instances, which he cites, of the shortcomings of physicians in this respect in connection with their offices, their homes and their conduct in public meetings. Stiles' experience is no doubt unusual and his criticism is probably applicable only to the careless few. It is true, however, that physicians should set an example for the public in hygienic matters, and that they should be almost over-scrupulously clean for

the added reason of safety to their patients. This severe castigation of physicians is valuable therefore in calling again to the attention of physicians the importance of strict personal and practical cleanliness as an aid and example for the public.—*Jour. Am. Med. Assn.*

The abstract referred to above is as follows:

"Experience forces Stiles to the conclusion that there is not an inconsiderable number of physicians in practice who have exceedingly elementary ideas on the subject of cleanliness. He says that an entire book could be written on the condition of the privy one finds at the home of the average physician in small towns and in rural districts. In by far the majority of instances Stiles has seen, these guardians of the life of human beings have the common surface privy, open in the back, scattering soil pollution, breeding flies, and thus providing human excreta as a condiment to the food consumed by themselves, their families and their neighbors. The moral to the tale is, he continues, that resolutions adopted by these gentlemen as to the necessity for any given plan of public health legislation are somewhat lacking in weight of professional authority. Some of them seem to think that the only way to bring about a public health reform—much needed as it is—in this country is to put a physician in the president's cabinet. Without taking any stand as to the advisability of the existence of such a cabinet official, Stiles suggests that a full time county health officer who will, among other things, compel these gentlemen to clean up their offices, operating rooms, and privies, and force them to stop spitting on the floor, might contribute somewhat to a reduction of the death rate. Stiles cites some forceful personal observations."—*Jour. Am. Med. Assn.*

THE LOOK AHEAD.

It is the druggist who can see ahead who gets the bulk of the business. He gets it not merely because he can see ahead, but because he takes proper advantage of that foresight. The man who looks ahead is the man who sees what goods will be in demand two or three months from now and prepares his stock in advance. It takes no particular shrewdness to make a note from day to day of the articles that are called for and to order in accordance with the immediate demand. Anybody can run a store on the basis of present day demands. But not everybody can run a store successfully on that basis. It is the look into the future that enables a man to meet the coming demand when it first appears. It is not difficult to anticipate the demands of the coming spring by studying the market and referring to the details of the business done last spring. It is not because it is difficult that comparatively few druggists look ahead far enough and often enough. It is because they do not think of it or because they do not think it worth while. Nothing is better worth while in all the realm of storekeeping than looking ahead and studying the probable needs of tomorrow. It may almost be said that today will take care of itself with the present stock. The successful druggist must learn to live in the future a part of his time. One of the best glasses through which to see the business future is the trade paper. —*American Druggist.*

Papers Presented to Local Branches

PROGRESS OF PHARMACOPŒIAL REVISION.*

JOSEPH P. REMINGTON, CHAIRMAN.

Professor Gathercoal is responsible for my presence in Chicago at this time and I appear before you with pleasure. The making of a Pharmacopœia is constructive work by a large and representative committee and it is not *my* Pharmacopœia.

As the final work of the Revision of the Pharmacopœia approaches, it must be understood that several questions are in abeyance. At the beginning of the work of revision, it was realized that the Ninth Revision would be for several reasons the most important in the history of the work. The passage of the National Food and Drugs Act and State legislation have enlarged greatly the scope and usefulness of the Pharmacopœia and of course the responsibilities of revision are much greater.

At the Pharmacopœial Convention held in Washington it will be remembered that a recommendation was made that publicity should be given to all changes in standards and descriptions before the issue of the work. The principle of this recommendation was mainly to give to manufacturers, dealers, pharmacists, and physicians a full opportunity to comment and criticise. This principle of publicity has been in force in the United States for a number of years. When a law is proposed in Congress, or even after it has passed one or two branches of the Government, it has become the custom to invite parties interested to attend what is called a "hearing" before a congressional committee, the object of which is to obtain information from all sides as to the practical enforcement of the law. In this way important amendments may be made to the law and this may now be termed one of the principles of the American form of government, and it is most essentially different from acts passed in a parliament, a reichstag, or the mandate of an emperor. In republican forms of government throughout the world, hearings and consultations with experts and interested parties are being recognized as essential to good government.

In the Revision of the United States Pharmacopœia, hearings have been already held; in fact, the present Pharmacopœia is being thoroughly revised in public. When Dr. Charles Rice published the Digest of Comments on the two previous Pharmacopœias, he foresaw the advantage of gathering criticisms and comments from all sides. This he published in book form and anyone interested could procure a copy by applying to him. The Eighth Revision has had the advantage of a Digest of Comments published by the Public Health Department of the Government by which the principle of publicity was greatly extended.

*Read before the Chicago Branch, Feb. 16, 1914.

Of course, it will be impossible to embody every bit of advice which is now in the hands of the Chairman of the Committee of Revision. Many of these show great variance of opinion; individual likes and dislikes abound. Many of the comments and criticisms are founded on insufficient knowledge and experience, as anyone could easily suppose would be the case—an increase in one or the other ingredients, a different mode of filtering, the elimination of a tendency to precipitate, the preference for a different flavoring, and other changes of minor importance.

The present Committee of Revision were confronted with an enormous task and now the work of making a selection, which, in their opinion, is the best, is occupying much attention and an embarrassment of riches confronts the Committee. In former years, when the Pharmacopœia was once issued it was the habit to wait five years before making any material change through the publication of a supplement. Of course, any errors were corrected immediately, but very few additions or changes in admissions or deletions were ever made; but ten years is entirely too long to wait for a new Pharmacopœia and it is proposed to make changes in the future more frequently in order to keep the Pharmacopœia abreast of the times. This will undoubtedly be done in the future, but we must attend first to the issue of the new Pharmacopœia as promptly as possible before a definite decision is made as to this part of the work.

The most important questions now pending are the tests for volatile oils, for whisky, and a few additions and deletions. The scope of the Pharmacopœia has occupied a great deal of time and there are a few subjects still awaiting final decision. The inclusion of Mercuric Chloride Tablets with a selection of the most desirable form for their administration to prevent possible accidents is the question of the hour. A decision has been reached to admit these tablets, but the best way to prevent the disastrous accidents which have been so industriously set forth in the public press has stimulated the inventive faculties of manufacturers to such an extent that the Committee is confronted with a great mass of detail. Manufacturers have vied with each other in putting upon the market many forms of tablets and a great variety of containers. The subject is exceedingly important.

One of the latest duties referred to the Committee of Revision has been the formulating of an official declaration of what constitutes a poison. Undoubtedly this question has been before the world for centuries.

A poison, in the common acceptation of the word, is a substance that produces a deleterious action upon life; but this definition is too broad and general to be serviceable in food and drug legislation—a lawyer would like to have a more specific definition. The Pennsylvania Pharmacy Law defines a poison under Section 10 as follows: "A poison in the meaning of this act shall be any drug, chemical or preparation, which, according to standard works on medicine or materia medica, is liable to be destructive to adult human life in quantities of sixty grains or less." The danger in specifying sixty grains or any definite figure lies in the fact that the limit cannot be justly or accurately fixed. Why not make it sixty-five grains or a hundred? Would a substance not be a poison if it were proved that cases were recorded in standard works on medicine or materia medica if sixty-five grains or one hundred grains have been safely administered? And

again there comes the question of idiosyncrasy; some patients will tolerate enormous doses of a substance which would prove fatal to others even if administered in one-half the quantity. Would it be just to prosecute anyone under such circumstances? If a definite figure is adopted, injustice will be sure to follow, and yet it must be admitted that there is great necessity in having a definite figure. The Revision Commitee must thrash out this question and reach a decision. This illustration furnishes a type of some of the problems which require settlement and, which ever way the question is settled, criticism is sure to follow.

The admission to the Pharmacopœia of substances known as protected, proprietary, or patented, has caused considerable discussion. It is universally admitted that a pharmacopœia should not advertise the products of one person, firm or corporation. Unjust discrimination would be charged and a precedent would be established and other persons, firms or corporations would demand recognition. How could a pharmacopœia provide tests for an article over which they have no control? The manufacturer would change at any time his tests or even the color of his product as often as he wished and make the pharmacopœial tests obsolete. But suppose the manufacturer of a protected substance consents to its introduction into a pharmacopœia under tests which he approves; he is virtually abandoning his control. The obstacle here is an insurmountable one, for no manufacturer yet has consented to forego the profits which he is enjoying from his protection for the sake of encouraging his competitors. The sole object of patenting or copyrighting the name is to gain profit by excluding competition. In our present Pharmacopœia, acetphenetidin was introduced as a coined word to avoid the use of the protected name "phenacetin." The manufacturer made no objection officially because his patent had a very short time to run and the question was met by marketing it under both names. This case was exceptional, but if a manufacturer had fourteen years protection ahead of him, it would seem to him a foolish piece of business to surrender his profits for the questionable honor of having his product admitted to the Pharmacopœia and losing the complete control of the tests for proving the identity and purity which would follow the surrender and opening the door for unlimited competition.

I will be glad to answer any questions which I can and receive whatever suggestions you may offer and they will be sent to the appropriate sub-committee for consideration. In work of this character an individual member of the Committee cannot hope to have his ideas always adopted. The combined judgment expressed by a majority vote must prevail. This method of revision, while both Republican and Democratic, is also Progressive.

Systematic methods of procedure in working out the detail are used, and, as the final days of revision are here, definite decisions must be reached. Let us hope that errors of judgment will be absent when the book appears. While discussion has been free and very earnest and impressive arguments have been used by individuals, the Chairman is glad to report that an excellent spirit and feeling exists in the Committee as expressed through the official circulars, letters and bulletins.

"THE PHARMACOPŒIA: ITS LIMITATIONS."*

MRS. ST. CLAIRE M. RANSFORD-GAY.

That the present outlook for the drug business is a serious one, is not denied by even the most optimistic, and the great decrease in prescription work, as well as general drug sales, has been laid to everything, from the tariff down to the dispensing doctor and the patent medicine man, but as the condition has gradually grown worse, and looks as if it was receiving sufficient nourishment from somewhere to make possible its continued decline, it is only fair to assume that as yet the crux of the situation has not been reached, or at least some of the causes for which pharmacy itself is directly responsible would be corrected and a few of the errors removed.

In holding others guilty in even a measure, for pharmacy as it exists today (and exists is used advisedly), has pharmacy placed the blame where it really belongs? To me it appears that it has not. It seems that none who could aid in the regulation has had the courage of his convictions in placing a few responsibilities where reformation is sorely needed, or the U. S. P. would not be ten years behind the times, and the N. F. a book of poor duplicates of proprietary preparations, instead of each being a living testimonial to the professions both of pharmacy and of medicine.

The dispensing doctor is responsible in a large degree for the decrease in prescription work, and until the medical schools wake up, and really teach their men that drugs intelligently used do give results today as well as years ago, just so long shall we have the 20-drug doctor, who does not even write prescriptions for these but is a most ardent follower of the label and literature supplied by the detail-man, and while we feel that the doctor who allows the detail-man to prescribe for his patient is not entitled to respect, still he is no worse than the pharmacist who buys rather than makes his own pharmaceuticals.

That we know such conditions exist in both professions is substantiated by the fact that a certain large manufacturing house finds it profitable to run a post-graduate course for its employees in order to keep them abreast with the newest in medicaments, and equally alive to the best methods of employing the older drugs. These salesmen go out, primed with the newest ideas, canvass the medical field, and supply to medical men information which they utilize, all of which relates to that particular firm's application of the newest experiments in medicine and surgery.

Does the U. S. P. do likewise for the retail pharmacist? Can we confidently turn to the U. S. P. and learn the best way to dispense, the origin, and use of the newer drugs, or even the older ones? No we cannot, but we could if the U. S. P. had a national laboratory where pharmacy might work hand in hand with medicine and surgery, and so be able to supply the best drugs, in suitable form and elegantly dispensed, as the standard and official preparation of its class.

* Read before the New York Branch, Jan. 12, 1914.

Then would the pharmacist be able to fill with confidence any prescription that is called for, he would know that it was the concerted product of many scientific minds, regardless of overhead expenses, rather than the formula of one man, no matter how clever, who must consider the great item—expense—perhaps to the detriment of the preparation. Were it not for the drug journals and their willingness to help pharmacy, we should have no book to which to refer, when information concerning newer remedies is requested and necessary, but even these publications are at the mercy of the manufacturer, and can tell only what the originator of the preparation cares to make public,—so, that even these sources are not really adequate, and as events have proved, these are times when the manufacturer has exploited most carefully all the good points of the preparation but entirely neglected to mention the precautions to be observed in its use, which are equally as important.

At the present time pharmacy is entirely dependent upon medicine, but if pharmacy is a profession, why look to medicine for sustenance. At best, in the present, pharmacy acts merely as a vehicle for the ideas of others, it does not originate nor create of its own accord. Consequently it is the servant of those who do create. The opportunities for us to know absolute facts exceed by a million those of the doctor—for we can start with the knowledge of definiteness, and step by step as the process elaborates quantitatively determine our results.

Why then should the pharmacist allow the opportunity to prove his ability slip by? If through lack of education, then improve the course; if because of the non-existence of a national laboratory that can furnish monthly digests which will keep pharmacy abreast with the progress of medicine and surgery, then it is time that the pharmacists of the United States get into action and demand that some of the national money wasted on other things be directed to the establishment of such a laboratory, in order that pharmacy may retrieve itself, and be as it was originally intended to be,—a help to mankind.

That doctors want elegant preparations, has been demonstrated beyond a doubt, and their liberal prescribing of preparations other than those of the U. S. P. proves their complete disregard for the book. They consider it obsolete, which is emphasized by many facts, among which may be mentioned—fluidextract of ergot—it is only of late years that any except that of one manufacture has ever been used, and even now does the average doctor ever think of using any except the ether and chloroform of the same manufacturer? No, because ether and chloroform to be acceptable for anæsthesia, must be highly purified, and in spite of this fact, the U. S. P. allows an appreciable amount of water and alcohol, and as this appears to be of great moment, it is not lost sight of by the firm's detail-man, and physicians, after his learned explanation, are afraid to use any but his particular product. So true is this that books on medical jurisprudence fail to recognize any other brand.

It may have been true in earlier days that there was only one brand of ether or chloroform, suitable for use, or even but one fluidextract of ergot, but it is just as reasonable to suppose, that today this is a fact, as it is to suggest that only one pharmacist can make a quinine pill.

If the guarantee of the U. S. P. amounts to anything, then any product turned

out by any reputable manufacturer and labelled U. S. P. should be acceptable. Also why the necessity of going to court to prove that hexamethylenamine is the same as the proprietary preparation? If on the other hand the proprietaries are advertised as being identical with the U. S. P. the results obtained should be the same, and clinicians should not be disappointed, as they frequently are.

What requirements are necessary in a preparation to make it official in the U. S. P. instead of the N. F.? Why is Elix. Aromatic in the U. S. P., and the complete line of similar preparations, equally as important, in the N. F.?

The value of the coal tar products is an established fact, but there is no effort on the part of the U. S. P. to introduce or do research work on these, and with the exception of the introduction into the book of a few products upon which the patent rights have expired, there has been, not even a feeble attempt to offset the manufacturer in this direction and help the retail man so that he does not have to pay a most exorbitant price for something, of doubtful as well as known value, whose popularity is obtained primarily through good advertising.

It is time the U. S. P. became modernized, and since it has duplicated so many preparations of the manufacturers, it might be well to take a few hints as to their methods of creating a demand for the products by letting the physician know that the book contains all that is up to date and that the preparations are thus standardized and officially guaranteed.

Also, that the tests, methods of preparation, and general dispensing notes be made so explicit, that all pharmacists can with ease produce a uniform product. Then will the legitimate work of the true pharmacist be restored, and the manufacturing man no longer usurp it, nor destroy the ethical relations of pharmacy and medicine.

Our stores will resume their proper position in the mercantile world and many of the sidelines now indispensable through lack of real pharmaceutical business, will be discontinued not only to the advantage, but with the hearty approval of pharmacy.

THE CULTURE OF THE EDIBLE MUSHROOM (AGARICUS CAMPESTRIS) AS A HOBBY FOR THE RETAIL PHARMACIST.*

A. J. KLINE, MINNEAPOLIS.

Before relating my own experience in connection with the study and culture of the mushroom, it may be well to briefly refer to the subject in a general way.

When one asks the question as to which wild mushrooms are safe to eat and which are poisonous, a very common answer is that they may be divided into two classes, first those which are "Deadly Poisonous!" and second those which will "Kill Sure!" The average person is not inclined to test the edibility of the numerous wild sorts, and those who are possessed of some knowledge concerning those suitable for the table will usually shun inquiries or answer "yes" or "no."

* Read before the January meeting of the Northwestern Branch, A. Ph. A.

These quite general conditions are undoubtedly the prime cause for the limited use of this fine food. Most people do not realize the great annual loss of food from the non-consumption of the edible fungi. The fact that the average person is not able to distinguish between the different varieties and hence eats none at all is without question a very fortunate restriction.

As a matter of fact there are very few, *very poisonous* mushrooms and these belong to the genera known as Amanita. Those of this group which are most toxic are *Amanita phalloides, Amanita verna* (said to be a form of *A. phalloides*), *Amanita muscaria* and *Amanita solitaria.* The last named species is said to be edible, but according to Clements "it is dangerous on account of its resemblance to the poisonous Amanitas and every one should avoid all risks by leaving it entirely alone."

There are a number of fungi which while not deadly poisonous contain power-

Fig. 1. The common wild mushroom (Agaricus campestris). Fully developed fruit bodies, the gills are clearly seen as is also the membranous ring or annulus on the stem.—
(After Freeman in Minnesota Plant Diseases.)

ful emetic principles. These include such as *Lepiota morgani* and *Clitocybe illudens.* It is interesting to note in this connection that a peculiar idiosyncrasy exists in certain people who are not affected by the emetic principles.

Altogether, there are from three to four hundred different species of mushrooms which are known to be edible and from fifteen to twenty which are poisonous. Then there are many others which as yet have not been tested, leaving an opportunity for any who may desire to make martyrs of themselves.

Before proceeding to indicate some of the characteristic danger signals of the poisonous mushrooms, it may be well to call attention to the various parts of the mushroom plant. The plant body proper consists of numerous thread-like cells which ramify the soil or compost in which the plant is growing. These thread-like cells or hyphæ are known collectively as the mycelium and from the mycelium the upright branches arise which we call the toadstool or mushroom. The mushroom is the fruit body or spore-bearing-organ and usually consists of several well

differentiated parts. First a stalk usually spoken of as the stipe and which may be enlarged at the base and sometimes enclosed in a short cup-shaped sac called the volva. Upon the stalk there develops a more or less umbrella-like portion known as the pileus which varies greatly in shape and size depending upon the age and species. On the under surface of the pileus, which is known as the hymenium, are developed the gills or in some species these gills are replaced by teeth or pores. Upon these latter organs the spores are produced. When the mushroom first makes its appearance above ground it is in the form of a more or less rounded head which is spoken of as a button. At this early stage the gills are usually covered over with membranous tissue known as the veil, later

Fig. 2. Agaricus campestris, a cultivated variety grown by Mr. A. J. Kline from pure culture spawn. (Original.)

the veil becomes ruptured leaving a more or less distinct ring around the stipe or entirely disappearing.

The following rule concerning the selection of the edible fungi has been given by an expert on the subject: "Avoid eating all mushrooms with white gills, a ring around the stem and a cup or scales at the bulb-like base of the stem, to be in no danger of fatal poisoning. Since the volva, especially when scaly, disappears with maturity and sometimes the ring also, care must be taken to apply this rule to young plants." The collector should also be on guard for the species which contain emetic principles, for while they are not deadly they may cause illness. Finally unless one is an expert on the subject it should be a fast rule to give no advice to others on the edible qualities of any specimen.

The culture of the edible mushroom is becoming more and more a subject of general interest and while there is nothing difficult about the work many fail

from lack of adherence to certain general rules. Five conditions are very essential for the successful cultivation of the edible mushroom, viz.: reliable spawn, properly prepared compost, temperature, humidity and fresh air. For the cultivation of the mushroom the compost must first be prepared. Fresh horse manure is the most suitable material to use for the compost. The manure should be moistened with water until it is uniformly damp and so that water will not run out when squeezed. It should then be thoroughly mixed and put in piles three or four feet deep. In seven or eight days the compost will have become quite hot by fermentation brought about by the action of bacteria. At this stage it should

Fig. 3. Morel fungi (Morchella esculenta). The ridged caps are to be regarded as everted cups, whose surface has become ridged and hollowed to afford large area for spore formation.
(After Freeman.)

be spread out, re-moistened and piled up again. This process is usually repeated again at the end of the third week, at which time any straw or coarse litter in the manure will be soft and pliable.

The compost is now ready to be placed in the beds or boxes. If beds are made they should be of such size that one can reach to the center from either side. The moist, but not wet, compost should be placed in the beds and firmly packed down to a depth of ten or twelve inches. A thermometer should be placed in the compost and when the temperature drops to 75° F. the bed is ready to spawn or plant. The temperature best suited for the growth of the spawn is between 55° and 65° F. Ordinarily the cultivation of the mushroom should not be at-

tempted during the hot summer months, owing to the presence of insect pests which are very apt to make the mushrooms wormy and unfit for use.

The spawn consists of dried compact masses of turf or compost, containing mycelial threads of the mushroom. Spawn is a commercial article and a number of different varieties are offered. One form which earlier was much in use is propagated directly from the spores. The spore culture spawn does not seem to yield as uniform and satisfactory results as a product of later introduction known as pure culture spawn. This latter spawn is produced by vegetative reproduction and selection which assures the constancy of the variety or strain. One of

Fig. 4. Shaggy-mane fungus (Coprinus comatus). This is an inky-gill fungus. The cap is seen to be blackened at the base, where the whole substance of the cap deliquesces and drops its black spores in an inky mass.—(After Freeman.)

the best pure culture spawns is prepared in St. Paul and known as Lambert Pure Culture Spawn.

The spawn should be broken into pieces from one to one and one-half inches square and these pieces should be placed one or two inches below the surface of the compost, the pieces being about a foot apart. After the spawn is planted the compost should be firmly packed. If the compost and spawn are in the proper condition the plant will begin to run in from a week to ten days and innumerable mycelial threads develop throughout the compost. The bed is now ready for "casing." This consists of placing over the compost a rich loam covering from one to two inches deep. This casing should be firmly packed down, but no watering should be done at this time. An excess of moisture will kill the mycelial

threads as the mushroom requires a large amout of oxygen which it derives from the air and at the same time the plant gives off a large amount of carbon dioxide. This process is just the reverse of that which takes place in the manufacture of food by plants which contain chloroplasts, although in the process of respiration CO_2 is given off by the higher plants. The failures of beginners are usually due to a lack of fresh air or to too wet compost, either condition resulting in a deficient amount of oxygen for the growth of the fungus.

The humidity should be just about at the point of saturation and should remain so. Damping off sometimes occurs and this is usually due to sudden changes in

Fig. 5. The shaggy-mane fungus (Coprinus comatus). This fruiting body is in a more advanced stage of deliquescence than that shown in Fig 4; almost the entire cap has dripped off. A ring (annulus) is seen at the base of the stalk. (After Freeman.)

temperature or too much moisture. The great amount of CO_2 given off necessitates a good system of ventilation; as the CO_2 is heavy and will settle to the lower layers of atmosphere it is sometimes possible to arrange so that it will run off through a low door, window or pipe. A vent pipe having some draft will usually remove the excess CO_2 satisfactorily.

Mushrooms will not grow in wet, unclean places where the air is vitiated. There must be an abundance of fresh air along with other suitable conditions. The plants will grow in the light as well as in the dark, a dark room not being essential but most desirable owing to less danger from insect infection. The best time to collect the mushrooms it is at the time when the veil is about to leave the pileus. Some growers allow them to develop more before collection as the

weight increases very rapidly; the quality however diminishes. After six or eight weeks of collection the soil and compost become exhausted and the beds must be cleaned out, disinfected and rebuilt. In the collection it is preferable to pull up the mushroom by twisting motion rather than to cut it with a knife as this latter process leaves a portion of the stipe which will decay. After collection they should be cleaned and trimmed and if to be marketed packed in boxes or baskets of from one to three pounds capacity. Mushrooms may be safely shipped by parcel post and at present the demand seems to be in excess of the supply.

The food value of mushrooms ranks well with many fruits, although they are not in the class with highly starchy or highly nitrogenous foods. For those who wish to grow mushrooms I would recommend the planting of some of the pure culture strain of Agaricus campestris, yielding the common mushroom, or of Morchella esculenta, the common Morel, which I believe is being offered in spawn form at the present time. For home consumption the shaggy mane or Coprinus comatus is much employed by some. The specimens I have here represent a strain of Agaricus campestris that I have grown in my cellar. The study and culture of the plants not only gives me much pleasure and recreation, but I also have a continual supply of this delicious food for the table.

WINDOWS AND WINDOW DRESSING.*

ARTHUR C. SCHULTE, PH. G.

It seems strange, if not absurd that anyone in any line of business in the commercialized world of today, need be told the value of window dressing as it is so evident on all hands. It would look indeed strange to the most casual observer if he did not see the windows, principally of the department stores and tailoring establishments, dressed as they are today. If one would stop to think of the enormous amount of money expended in window-dressing week in and week out he would be forced to say, "There's a Reason." The druggist today in business who does not give his windows their proper attention is either indisposed, due to lack of ambition, or else he is merely running his store as a convenient place of address. It's a fact that some druggists will sit on their chairs with their hands in their pockets, smoking a cigar and say, "What's the use?" But if you look around their stores to see the condition of things as well as the stock, you will have little cause to wonder why their business is going backwards or why they will always complain of business being "on the bum." Druggists in business today with ideas of twenty years ago have no business being in business. They have lost their place. They are holding back, as it were, opportunities which if allowed to develop would count as dollars and cents on the cash register. The men who say that their customers would not stand for the new ideas in business, and that if they did introduce them they would lose their trade are out of luck, and generally this argument is merely a mask to hide behind the cloak of indifference. The druggists who rely on a patronage of twenty years ago are working under a delusion, for while an established name is an adjunct to any business, still that patronage dating that many years back has passed away, and the new blood that takes its place demands the new order of things.

Here is an idea of the store of twenty years ago doing business today that came to my notice. On the ground floor the windows were made up of many small square panes, several of which had been mended with

*Read before the St. Louis Branch of the A. Ph. A.

newspapers. Through them one was almost able to distinguish the interior. In the foreground stood a broken bottle shaped like a mortuary urn and half full of pink liquid. Besides it reposed a broken packing-box in which bleary camphor-balls reposed between faded sheets of blue paper. Of these a silent companion of misery stood on the far side of the window—a towering pagoda-like cage of wire in which were trapped, doubtless, by means of some mysterious bait (known only to alchemists) three worn but brutal looking sponges which were apparently slumbering in exhaustion. Back of these a dirty plaster cast of a male figure lightly draped seemed to represent the survival of the fittest over some strange and deadly patent medicine. The recessed door bore an inscription in gold letters, tarnished and half obliterated:

RANK G HAM
RUGS & HEMIC LS
PR SCRIPT ONS CAR FULY
C POUND D.

The interior needs no description. Here is an idea of what some druggists will say is known as an old land-mark and if changed, the patronage would drop off. Do you believe it? I do, but I would say that it has dropped off so long ago that nobody knows that it ever existed.

From an advertising standpoint, I hold that there are no mediums, such as newspaper inserts, circulars, calendars, almanacs, etc., so powerful, for the moderate or small business man, such as the druggist, or so comprehensive or so satisfying to the prospective purchaser, or so economic to the druggist as a well-dressed window. If one-tenth of the money spent in other methods of advertising was invested in window dressing, I believe that windows would rank first as a medium for increasing business. Of course, other means are sometimes necessary, but the window is the link and should be the connecting link, bringing in the purchaser, in the great chain of advertising. It is the link that serves as the last impetus to bringing in the new customer. Lots of money might be lost and is lost, because of the lack of properly dressed windows where the individual can actually see the articles that have been advertised, as the decision is made then, and nine times out of ten the sale is completed.

I ask you why is it that these big manufacturers will spend thousands of dollars in the newspapers in launching a new article, especially a patent medicine and then will come around and inquire whether they can put in a window display and in some instances even offer to pay for the window. Why is it? It's because these men, trained by experience, know that the last place, the jumping off point as it were, for the sale of their articles is the druggists' windows, and if seen there will serve as the last reminder of what they have been hammering at in the newspaper. Do you know, that some downtown drug stores receive from $50 to $100 a week for the loan of a window? And that this much is paid to the proprietor to bring purchasers into his store? Do you think these men have money to give away? I should say not. How much are your windows worth?

The value of a window that is well dressed does not lie especially in its attractiveness from an artistic standpoint, but mainly in its pulling power, the power to attract and hold the passer-by long enough to convince him that he really needs the displayed article; or else that it will serve to indelibly write on the individual's mind the fact that Mr. So and So keeps that article, displayed, and especially at the right price, and when he needs that article he will buy it there. The length or duration of the effectiveness of a display has never been, nor is it capable of being computed. For example: A display that I put in the window last May was brought to my attention in November by a customer asking for a can, a red can for bed-bugs, that he had seen in the window some time back, he didn't remember where. At once I knew that he had reference to a display of Bug Killer that I had displayed in the window in the before mentioned month.

Displays of such articles as brushes, combs, writing-paper, shaving mugs, mirrors, etc., and such other articles that ordinary purchasers look to the department stores for when they need them, will serve as a reminder that you keep them, and long after a display is removed you will get a call for some article that you had displayed months previous. In the case mentioned above yon can contrast the effect or force of newspaper advertising, or what the effect of a one-time insertion in a newspaper would be as compared to a one-time window display. The window is the mainstay of the small or large druggist who believes in doing a little more

business. Some men, purely ethical, might criticise the display of combs, brushes, or other sundries in the windows of drug stores. That might be all right, but the druggist today cannot, conveniently, be too ethical or he will be crowded out by his competitor. It is a deplorable state of affairs that the present day druggist has to resort to sundries to make his business pay, but the people ask for them, demand them and the requests today are almost unlimited. The other day a lady asked me if we sold fruit. I told her no—then she said, "Oh! well, I guess I will take some cakes." I told her we didn't sell cakes. She said, "Oh! do you only keep candy?" This is a true incident and only shows the trend of the druggists' business. And why shouldn't the druggist handle anything and everything that is profitable as long as his trade demands it? As conditions now are, almost all of the druggist's prescription business is cut off by the dispensing doctor, and the bulk of his drug trade by the department stores (the ten-cent stores have taken away our last staple seller, Peroxide of Hydrogen, 1 lb. at 8c), he is forced to look around for added means of a livelihood. I think it is just as well to sell a woman a box of paper at 25c and make a few cents profit as to greet her with a smiling countenance when she asks you for five two-cent stamps to mail some letters, the material for which she has bought down town.

Window dressing is an art, and unless the window dresser has some artistic temperament the best way for him to dress a window is to leave it alone. The best system for finding out which one of the clerks is the best window dresser is to try-out first one and then another. After they all have had their turn, pick the one you think is the best, and let it be known that from that time on it will be his duty to dress the windows. Of course, you do the choosing as to what you want displayed. It is then left to the individual to develop within himself the latent temperament. So many boys, or I should say young men, have asked me, "How do you do it?" not in the sense of praise, but for the sake of information, pure and simple. They ask me if I think a course of instruction in some correspondence school would make them efficient as window-dresser or whether it would be a good thing, and so on. As you know, various schools realizing the value of window dressing as a field for activity, have included a course of instruction in window dressing, but believe me, no window-dresser can be made, and these courses are worthless unless the artistic capacity is inherent in the individual. The window-dresser can be improved, or perfected, possibly, by such a course, but that is all, and at that, a chance. A good window-dresser will profit more by experience and practice than by any other means. We say, to use a popular expression, that "So and So" has a "knack" of dressing windows and that really is the truth, the knack of doing it.

The good window-dresser profits by observation, and suggestion as well. In going around he sees other windows and at once ideas are suggested. If he is a true artist he will not copy, but change according to his own notions, and the new creation is then stamped with his own individuality. It has been said and truly that the window is the eye of the drug store, and like the 'eye is the window of the soul' in the human being, so the soul or interior of the drug store today shines through the window, and it is a safe bet that the well dressed and up-to-date window will show a modern store on the inside, and a poorly dressed or neglected window will show a neglected or behind-the-times store on the interior. Remember, that the man today who is prosperous shows a clean front, and by keeping a clean front, a well-dressed front, he is advertising his business methods, besides reaping the profits thereby. In going through any business section, you don't have to be told which store is clean on the inside, and which store keeps a complete stock. You'll look at the windows and decide for yourself. And that is what others do about your store.

In dealing with windows, there are two kinds to take into consideration, namely, the open or unprotected window and the enclosed or protected one. To dwell on the open window is a waste of time unless by so doing we can convert the owner of such windows, and convince him of the folly of attempting to make displays in the open window as offset by the thousand-fold possibilities of the closed window. The man who is interested enough in his windows to dress them will not tolerate for any length of time the open window, or will not remain long in ignorance of the fact that he is wasting his time, if not money, in bothering with them as it is impracticable to display perishable goods, which are generally

the ones necessary to display. He will also find that he is losing money as he cannot display profitable goods as the material at hand is generally in the from of folding cartons from patent-medicine houses, or cigarette displays from the various tobacco houses. The open window is unprofitable from the standpoint of soiled packages that after being displayed must be destroyed or sold at a sacrifice to get rid of them. Take for instance writing-paper, face powder or even rubber goods and display them in an open window. The material or products themselves are not harmed, but the containers are, and no one can tell me that a box of writing paper or face powder will sell very readily or satisfactorily that is marked by the peculiar tendencies of an open window display. In summer the flies and dust are the main items to take into consideration, and I wonder how many new comers will have their palates tickled by the display of bulk candy in an open window, where the flies and bugs are having a royal contest for supremacy, coupled with the dust that is blown in the open door at the passing of a street-car or the blowing up of the wind.

Of course, the closed window might have its objections, but they will be outnumbered by the open window. It has been said that the closed window causes sweating, and that the moisture condensing runs down and ruins some part of the display. This might be true, but if the proper precautions were taken, there would be no sweating, and consequently, condensation. The problem resolves itself into a pure one of physics. We know that moisture will collect on the outside of a pitcher of ice-water—why? Because of the difference of the temperature inside and outside the pitcher. The remedy for sweating windows is to equalize the temperature. Have the temperature inside the window the same as the temperature outside, and there will be no deposit. This can be accomplished by having the lower portion or floor of the window bored with holes connecting with the transom of the cellar. This will supply you outside air. Also at the top bore holes or make a ventilator opening, connecting with the outside air. This will produce a current of air and the cold will come in and rise, driving the warm air out at the top. And I would like to know what prevents the open window from sweating? We had open windows and they sweated; our doors sweat today. The temperature surrounding an open window cannot be regulated as you have no confined atmosphere. In seeking to remedy the sweating open window you will have to equalize the temperature of the whole store, which virtually means throwing out your furnace or stove in the winter.

The problem of sweating-enclosed-windows, even if for the sake of argument it were impossible to do away with, is better than the open window which, we also will grant for the sake of argument, does not sweat, as you have a longer period, say nine months, in which to display perishable goods as contrasted to three months of the sweating period. The problem of generated heat in the closed window in summer, as some will say, is without foundation, as a closed window with proper ventilation is bound to have the same tendency in summer, in which instance one can place a fan under the window and then the circulation of air is assured.

I am going to spend a few moments on figures that should interest the open-window proprietor. Our windows are approximately 7 x 6 feet in height and width and about 3 feet deep. Being tired of the open window, I took it upon myself to enclose them and proceeded as follows: Having brought the floor of the window up to the pane margin I took two uprights and one cross-piece of 2 x 2″ lumber and placed them at the back of the window to the required depth. I drew in the uprights six inches on either side and reduced in length the cross-piece, 12 inches, thus making the back edge or frame of the window one foot narrower than the front, or five feet, and the height of the back six inches shorter than the height of the front, forming a drop of six inches, making them six and a half feet in height. Then I put on the top, using one-inch yellow pine flooring. Then I put in the sides, allowing for windows almost the entire length and width of the side, say 5 x 2½ feet. Then I used two uprights of 2 x 1″ and placed them equi-distant from the sides at the back, marking the width of the door. Then by using two cross-pieces three feet long of 2 x 1″, I made or finished the casing for the door by placing them equi-distant from the top and bottom. Then the remaining upright and cross sections were again divided, forming panels, which were glazed, thus giving a full clear view into the inside of the store. Then by

using some quarter-inch quarter-round molding and putting in the glass, I had a window that was neat looking and absolutely dust-proof. The door I had made at the mill to make sure of being accurate, and used the hinge method to fasten it. This work was done at an approximate cost of $12.90 for two windows, a price that I believe is pretty reasonable, not counting the labor. I also bored holes in the floor as mentioned above, for ventilation.

The interior I finished in white, using four coats of white lead and two coats of zinc white and two coats of zinc white and damar varnish mixed. The exterior was finished to conform with the finish of the store, which was cherry. White, I believe, is the most desirable color, as it reflects the light, thus serving a double purpose. The usual objection raised that white gets dirty is a good reason for using it, as it serves as a good reminder that it is time either to wash the wood-work, or time to change a display, and thus acts as an incentive to one who is apt to become careless or negligent. This verging in of the sides and top makes a very effective window, as the whole window, top, sides and bottom, can be seen at the same angle and gives the appearance of a beveled picture frame with the display as the picture. The top and sides in a window like this make an admirable space for show-cards. But no matter how a window is enclosed, it can be made a selling factor and works toward the increase of trade.

The method, or series of display, adapts itself according to the seasons, and by that I mean that a druggist will or should make the proper displays in their proper seasons. We would not expect to see a display of fireworks in the month of December.

We know that in spring comes the blood purifiers, tonics, etc., and the method of displaying rests mainly with the individual. The display that usually marks spring is that of cream of tartar and sulphur lozenges, or syrup of sarsaparilla with iodide of potassium. Combined with the display might be shown crude sarsaparilla, various other herbs used in the formula, also the various chemicals used. This form of display will hold the pedestrian longer than any other method, besides convincing him, or at least making him think that the man behind that window really knows something about what he is trying to sell. The result of such a window is bound to produce new customers and an increase of sales.

The next regular spring display will fall about Easter; that is, an Easter window is next in order. An Easter display will hold good for at least three weeks. Not the same display, but the same material differently arranged each week, for three consecutive weeks. And spring displays, such as soaps, perfumes, cigars, candy, will always be appropriate trade getters.

Summer, commencing in June, also brings its various suggestions for displays, particularly talcum powder, and in this season real effective displays are produced by the use of vines, flowers, and Japanese lanterns, which are reasonably priced and readily obtainable. Writing paper forms a good item in this season when the prospective purchaser is thinking of taking his or her annual vacation, and of course will need some material for correspondence. Cameras also have their play in this season, and various other sundries, such as baseball goods, swimming caps, and in some localities, fishing tackle and paraphernalia. In July, fire-works, which, however, I do not think, if averaged, will prove profitable, everything considered, such as loss of insurance, or left-over stock.

Fall brings its house-cleaning and displays of sponges, chamois, paint cleaners, wall-paper cleaners, etc., have full play in this season. Real effective sponge displays can be arranged, and I will mention one. Place in the center of the window on the floor an electric fan, facing the top of the window. Fasten red and yellow crepe streamers to the wire guard. Then arrange a red bulb, with extension socket connection, at the center of the fan guard. Now pile the sponges around the fan until completely covered, forming a mound in the center, and also be sure to cover the floor of the window completely. If handy, place here and there some shells that you may possibly have on hand, and then hang chamois skins all round the interior of the window. This will make a pretty display and produces a unique effect. At night the fan and the light are turned on and the effect will bring people from across the street or some people in the cars will remark about the window. Of course, the usual "sign card" should be displayed, announcing that "Fall house-cleaning is at hand, and that Mr. Jones keeps a full line of necessities, selling at prices not the cheapest, but

prices consistent with the quality, which anyone knows varies greatly in sponges. In this season Thanksgiving Day affords an excellent opening for an effective window.

Winter now comes, and the windows in this season are either too small in size or too few in number to display the innumerable holiday suggestions that may be carried the year round, but which at this time have to be featured. Christmas, with its multitude of "Practical Suggestions," affords the window-dresser the same opportunity as the bargain hunter on a rainy day. Christmas displays should commence the first of the month and, of course, last until the first of January. In this season the best idea is obtained of the trade-pulling qualities and increased sale facilities of well-dressed windows. Most druggists say that the Christmas season makes little difference to them, but they are the men who don't go after the business, and nine chances out of ten are druggists who don't attempt to dress their windows. The bulk of Christmas trade is brought in through the use of the windows, and to the druggist who has an increase of from $800 to $1000 in this month, this means a good deal. This is the time when closed windows mean money with a capital "M."

During January, you have your cough and cold mixtures to exploit; your backache plasters, hand lotions, face creams and what not. In February comes "Valentine Day," and here is made possible a profit of from 100 percent to 200 percent on an investment of two weeks' time. Pretty good! And if a druggist sells $100 worth he knows he has sure made $50. Here you see is your closed window again. How long would "Cupid", as pictured on the valentine, be able to hold his dart in the face of the furnace smoke and the floor sweeper's dust? He would bow his head with dust in shame at the end of a week, or else change color with the mortification of the indignities thrust upon his poor naked body.

The means or method of displaying varies according to the material at hand. In some cases the "unit" system is best; in other cases the "group" system, where various items are grouped, making the display more effective. Then again, the "topsy-turvy" method is good, as in the case of a cigar display. You want to impress the smoker that you have something good at the right price. You can talk yourself blue in the face and still lose him. But you put this same cigar in the window, even if it is only one full box shown open, and throw promiscuously around on the floor of the window empty boxes or cans and write a card that "Here is the sale of the empty cans, 5000 sold in one week. There's a reason." You will have him in your store in less time than it takes him to read the sign to try one, for seeing is believing, and you have convinced him, if he is not too skeptical, that they are selling by showing the empty cans. And you make the sale, possibly, without uttering one word. This method is especially good on a transfer corner.

The best idea in dressing windows is to feature one article. For example, take talcum powder. In dispensing talcum powder I feature talcum and talcum only. Get the idea fixed and hammer it in to the individual that you are selling talcum and, if a special talcum, feature the best points over other makes, but most of all, feature talcum. Some stores fill their windows week in and week out with a conglomeration of articles, including everything from A to Z, and impressing, to my mind, the observer, as being a curiosity shop. This forms what is known to window dressers as a junk shop display and will only serve as a detriment to the store employing it. It is wrong, and there should be no excuse for it.

A good idea of the group display is shown in a window dressed with shaving supplies. Here you have shaving mugs, lather brushes, soaps, shaving sticks, powders, creams, strops and everything relative to shaving. But the main idea to the observer is that you have "shaving supplies" and that is the feature you are trying to impress upon him. As an added feature to a window of this character, you can cover the floor of the window with shavings obtained from some packing case. Put up your sign "Shaving Materials" and your window will move the goods. I know it because I have tried it.

Ethical displays, pure and simple, are unprofitable from a pecuniary standpoint, but may add to the local prestige of the proprietor. However, in the present day of commercialized pharmacy I believe that an ethical display by itself is impossible, if one wants to be very technical in discrimination. Ethical features, however, sometimes added to windows are good added attractions, such as a filtration process, or a percolating stand,

or even a distillation process. Then various items from the laboratory, if placed in a window, showing the working process of a preparation from its inception on through until it is finished, is good.

I cannot understand how any well-meaning druggist will fill up a window with such items as suspensories, trusses, syringes, abdominal supporters, and other various appliances that are known only to the needy and not needed by others. There isn't anyone who can convince me that a man will buy a suspensory or that a woman will buy a syringe or supporter because he or she sees them in the window. It is wrong and obnoxious to even the fairest minded critic. This idea, however, is not new with me, but the sentiment that I here voice is being taken care of by the legislature, showing that my view is not altogether prejudiced. Have you ever noticed a display of this kind? Did you ever stop to look in? No, and how many others do? The moment the individual catches what the window is showing, he or she hurries on, afraid that someone has seen him or her look at the window. And how does the young man feel who is walking with his lady friend and on looking up his gaze is confronted by a glaring display of suspensories, etc., or how does she feel, vice versa? They are the kind of displays that should be censured and stopped. The only ones who gather around a window of this kind are small girls and boys, kids, we'll say, and they stand there and giggle. What does it mean?

Most stores make the mistake of adopting a set form and never deviating from it. That is a bad idea. The idea to produce a display that is different is the one to be sought after; one that is not necessarily startling in being foreign to the drug trade, but one that is different from the standpoint of style and manner. Originality is the word that defines good windows, and does more good towards effective window displaying than anything else.

I can sell a hundred pounds of mint stick in a week at 5 cents a stick simply by throwing in almost the entire stock and making a dummy stick of immense proportions by pasting cartons end to end, covering with white crepe paper and using red crepe to mark the stripes. Hang this diagonally in the window—put up your sign "Big Stick, 5c," and that's all you need. Not only are your sales increased in that week at your candy counter, but you will have produced permanent customers for that item, and possibly created new customers for your general trade.

In the matter of changing displays, I would advise that the displays be kept not longer than one week, or in some exceptions, ten days or two weeks. Sometimes I have had people who have seen me in the act of breaking up an exceptionally attractive window, produced by using vines or lanterns, exclaim, "Oh, what are you doing that for; such a pretty display." The answer is in the question. This individual, and why not the other people, who are accustomed to passing your windows, saw this display and remarked on its attractiveness. They saw the display day after day, say for two weeks. Well, then, that display has done its work, and it is time for something new, different, and maybe, better than the one before it, and then those same people will look in the window and your window commences again to do its duty.

In the matter of price marks, I will say, that sometimes they are imperative, and at other times they are inadvisable. For instance, in special sales, clearance sales or cut prices. You have a sale for the sole purpose of featuring prices; that is, the prices or cut-prices are the main reasons for that sale, and they are the items that are going to make the sale successful, and so, of course, in instances of this kind, feature prices, and feature them strongly. Sometimes prices alone will appeal to the individual and they think if the article is cut they are getting the best of you. Not long ago I filled out an order with soap, wrapped, and in boxes that ordinarily would and does retail at 5c a cake. I placed this soap in the window and put up a card, "Special, 17c a box, only two boxes to a customer." That soap went like hot cakes, and after the sale I put it in the case at the regular price, 5c a cake. No harm done, and a nice little stock moved off my hands. Also in displaying a new line of goods, or a new toilet article, anything that is new on the market or new to the consumer, use price marks. But take in the case of, say a display of hair brushes. You display an assortment of brushes valued at 25c to $5. You put the price on every brush, but the first price that catches the eye is $5. The individual who sees it will throw

up his hands and exclaim, "$5 for a hair brush, my goodness, but they're high." And he will pass on and you will have lost a sale, possibly a customer. Of course, a fair-minded person will go a little further and reason the matter, but it is the ordinary individual we have to take account of, and the buying public is most ordinarily skeptical, and it's pretty hard to argue through a window glass. Grant that the brush is worth $5, say a solid ebony back with genuine hog bristles, one and one-half to two inches long. Anyone that knows the value will concede the price. But take the same display, do not use price marks but make up a show card something like this, "Our line of hair brushes is complete, prices consistent with the quality, from 25c up." With a window like this you will get the prospective purchaser in the store anyhow—and then the sale is half made. If they want a 25c brush, you are in a position to give it to them, but you at the same time have the opportunity of talking up the better wearing qualities and satisfaction in owning a better priced brush; in fact , to employ your salesmanship. You, at least, send away a satisfied customer with possibly a dollar sale made, instead of a person who, stopping at the price-marked window, will move on grumbling at the high cost of living.

Again, take a window around the holiday season. You can put all the energy you possess, pile all the goods you have into the windows, arrange them tastily and do everything in fact to make what is known as a good display, and leave off price marks and you will lose many a chance purchaser whom otherwise you would have captured. Take yourself, for instance. If you should see an item in a window, say a bottle of perfume; you knew you could use it, knew you had a place to put it where it would do most good; still you wouldn't, nine chances out of ten, go in and inquire the price, for fear it would not be satisfactory, and would leave you embarrassed. But let there be a price on this same package, say $1, you wouldn't hesitate long in reaching down in your jeans, if you wanted it, and marching right in with the intention of making that package your personal property.

There is one main item I want to bring out in window-dressing, and that is action. Action in a window is the greatest asset imaginable towards sale-producing qualities. A window with action is the greatest attention arrestor of any. A man demonstrating a safety razor, a woman demonstrating a face cream, in fact, any live working model is conducive to good results. But action does not necessarily have to be human. Live rabbits around Easter time are good, an aquarium with gold fish, live guinea-pigs, or mechanical devices that show what they are supposed to represent. You have seen them all; so have I, and you know how they worked towards drawing crowds to the windows. If you are walking down the street and see a crowd in front of a window, you hasten your steps, and then, when you reach the window, you pass on, do you not? Yes, you do not. You crane and crowd and crane your neck to see what's doing. It is that quality given to us all, curiosity, that makes you want to find out what is going on. And I needn't say that in such a window there is something moving. For the last four or five years, with the exception of the last two, and then because I couldn't get any, I have put live young rabbits in the window, made small houses, and the attraction was phenomenal. At the top I advertised Egg Dyes. You might say that the window as a profit-making factor was worthless. It might have been but for the fact that each year I sold young rabbits from 75 to 100, all I could get, at a profit of from 200 to 300 percent.

In employing color schemes by the aid of crepe paper I would say, do not overlook any holidays or special occasion, such as the Horse Show, or Veiled Prophets, etc. For the Fourth of July, of course, red, white and blue; for the Veiled Prophets, use purple and gold; for the Horse Show, use green and white, and so on. No matter how far removed you are from the scene of activities, the color scheme shows your patrons that you are up-to-date, a fact that might have some bearing when they are in need of something that must be particularly fresh or up to the standard. Remember, the druggist who is up-to-date will, is bound to, get the business, and if you are in business you might as well get all there is in it. As a general idea use bright colors in spring and summer and dark colors in fall and winter.

Druggists, dress your windows. An hour spent in making up a display is worth sometimes a whole day spent in figuring and planning how you will be able to move an item that is going exceptionally slow, and then

contemplating a cut in price. A window sends the message, the purchaser interprets it, and the druggist delivers it. That's the system. "System" is the word in the world of business-getters today, and the druggist who is content to sit idly by with his hands folded, complacently waiting for the people to come in to deposit their money with him, is wrong. He is the druggist who will barely exist, or else fail altogether. Such a druggist is wasting his time, and the sooner he finds it out and improves himself, or steps down and out and gives the other fellow a chance, the better off he will be, as interest on money sometimes fails, and at that is a poor excuse for neglect of business.

Before closing there is one item I have overlooked, that comes to my mind, which, however, seems hardly necessary to mention, and that is light. Light in a window is, of course, the main attraction. Use light and lots of it. As moths are attracted by the flame, so are the people attracted by light. Light effects in windows are attractive and easily produced. In a window with lights running around the edge, very pretty light effects are produced by tying squares of colored crepe, alternating the colors, such as purple and gold, or green and red in the Xmas season. This scheme has a very good effect and will serve to catch the eye whether the individual has time to spare or is hurrying to catch a train. Well lighted windows mean well-lit stores, and well-lit stores mean prosperous stores, and prosperous stores mean new business, satisfied customers and prosperity. Do you see it? It's easy to understand.

The druggist who dresses his windows today is the one who has judgment, good judgment, and uses it; has common sense and employs it, and last but not least, has good business ability and ideas and profits by them. Be up-to-date. The druggist today who is up-to-date, or at least who is thought to be, gets the money, and that, I believe, is one of the main reasons, if not the main one, why he is in business.

I hope this paper has been of benefit to a few or has instilled new thoughts or ideas into the indifferent, but whether you are good, bad or indifferent, you had better get in the band-wagon today and "dress your windows." There is so much to be said and done and so much that can be done that is inexpressible that I will have to leave off and beg to be excused from the floor, hoping that the many points that I have omitted will be brought out in the discussion.

CREDITS AND COLLECTIONS.

This is a good time of year to think about credits. In fact, any time of year is just splendid to think about credits, for like the poor they are always with us. You fellows with definitely formulated retailing policies have already done it, but you might be surprised to learn how many of the brethren just plod along and try to think of the right thing to do when the question comes up. They are easy-going souls who like their neighbors and don't want to have trouble. I used to number among my acquaintances a brindle pup of just that easy-going disposition. He slipped along without ever asserting himself, wagged his tail when kicked at, and seemed to try to apologize when he got stepped on. He was a nice dog in some ways and a good friend; but I always felt I should respect him more and take greater account of him in my calculations if he'd get his bristles up a little. The fellow who tries to get along with the least trouble and yields his business or his moral principles rather than risk giving offense is inviting trouble to hit him right in the eye. It's a pretty good thing to think carefully about what ought to be done in a given case before the case arises. Then when it does come a fellow has something to fall back on.—*Western Druggist.*

Of General Interest

PANAMA-PACIFIC INTERNATIONAL EXPOSITION.

CHEMICAL AND PHARMACAL EXHIBITS.

The exhibits from the chemical and pharmacal industries of the world will be shown in the splendid Palace of Liberal Arts at the Panama-Pacific International Exposition in 1915, and their extent promises to be as inclusive as their variety will be instructive and interesting.

The diversity of these displays is seen in the fact that soaps and prefumes are scheduled under group 36 of the exposition's book of classification and so are apparatus and processes for the compression and liquefaction of gas. Pyrotechnics, bombs and signals, together with matches, will find a logical place in chemical relationship with the by-products for pharmacal use obtained from treatment of petroleum and coal-tar derivatives. The evolution of the den of an ancient alchemist will be seen in model laboratories of the present with complete equipment installed.

The extent of the industrial interests that are embraced in this department is disclosed in the statistical eloquence of the United States Census Bureau which shows that there are 5,168 establishments in the United States devoted to the production of articles involved in the chemical and pharmacal arts, with an invested capital of $419,930,000, employing 109,309 persons earning $73,491,000 and producing $455,095,000 annually.

In connection with this exhibit it is expected that there will be carried on a most interesting series of public demonstrations—exhibitions for instance, of the research work carried out by the use of liquid hydrogen and illustrating the properties of matter at the temperatures approaching "absolute zero," should be of engrossing interest.

There is, according to scientists, a point at which heat is extinguished—where "the molecule ceases to vibrate." This theoretical point is called "absolute zero." It has been scientifically stated to be at 460.6 degrees, Fahrenheit below zero. The lowest temperature recorded by Arctic explorers is 72 degrees below zero, though balloon-carried thermometers have registered as low as 100 degrees below zero by thermometers carried to a height of nine miles at which altitude the 100 degrees below zero weather prevailed.

Another series of experiments that is calculated to prove as interesting in a popular way as important scientifically will be the demonstrations devoted to the exposition of liquid air. These experiments, as prosecuted under the genius of Professor Dewar, have been reduced to the terms of popular understanding without rendering negative their scientific value.

The principle upon which Professor Dewar constructed his apparatus for liquid air production is elemental. Vapors and gases in a state of expansion absorb heat and reduce temperature. His successful experiments grew out of the extremes to which he carried this principle and the marvelous precision of the apparatus employed. The low temperature required for solidifying hydrogen was attained in three progressive stages. The liquefier was divided into three concentric and corresponding parts. The low temperature of the first stage became the high temperature of the second and the low temperature of the second became the high temperature of the third. Step by step the theoretical, critical temperature has been approached and gas after gas solidified, the element helium alone reisting all efforts to reduce it to a solid state.

The Federal government's interest in these experimental processes is sufficiently indicated by the fact that the United States has installed a complete "low temperature" plant in Washington and is proceeding with more important experiments. Germany is another nation deeply interested, and the more recent achievements in that country in the field of synthetic carbon chemistry being

largely responsible for the reputation popularly ascribed to Germany of being in the lead of all nations in individual chemistry—a belief intimately associated with Germany's recent brilliant achievements in her color industries.

It is probable that these experiments in what until recently was the world's greatest mystery—next to life itself—the mystery of heat, will be carried on at the forthcoming exposition under the light of the latest research and knowledge.

Theodore Hardee, chief of the department of Liberal Arts, says that there has been a more than gratifying response made to his invitations to participate, and that all nations will send their representatives and products to this most interesting department of human enterprise. From attar of roses brought from Bulgaria—the world's almost single source—in the Balkan mountains, to perfumes from Brazil, herbs from China and medicine chests from France, the American exhibitor is promised much friendly but vigorous competition to the importance of which he is, says Mr. Hardee, fully alive, his concern arising no less from impulses of patriotism than from motives of business and the opening of new trade routes and commercial centers due to the completion of the Panama Canal and the consequent opening up of the Orient and the rich nations on the western coast of South America.

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ANNUAL MEETING OF THE AMERICAN DRUGGISTS' FIRE INSURANCE COMPANY.

The annual stockholders' and directors' meeting of the American Druggists' Fire Insurance Company was held on Tuesday and Wednesday, February 10-11.

The company is now saving its policyholders 25 per cent of their premium cost along absolutely safe and conservative lines, and if its growth in business continues, this saving can be extended to 30 per cent at a comparatively early time, and still greater opportunities along that line are sure to be realized with an increased volume of business. Every retail druggist in the country who places his insurance with the A. D. F. I. Co., thus adds to its ability to ultimately make greater savings in premium cost. The advantages for the retail drug trade of the country which will accrue from the undivided support of the A. D. F. I. Co. are far reaching and the best which may be hoped for from every source considering as the first essential absolutely safe and reliable insurance.

The Board of Directors found the present office quarters of the company to be wholly inadequate for its needs in taking care of the growing business. It authorized the Executive Board to find either a suitable site for erecting an office building or an existing building which with alterations would be suitable for an office building, in such case providing therein for sufficient office space for the company's use and otherwise adapted for rental purposes as an investment, providing, however, that only the surplus of the company above capital and reserves should be available for such purpose. It is the aim of the Executive Board to carry this project out by finding a location where the company will not only have immediate and profitable return from such investment, but where the company will also derive benefit from the enhancement of ground value.

During the year the company wrote insurance amounting to $12,569,310, at a premium of $127,960.36. As compared with other companies this represents a premium value on business written of $164,472.88. Of its business written during the year the company reinsured $1,141,450, at a premium of $13,-158.06. On December 31 the company had 6,916 policyholders.

The direct net savings as made by the company for its policyholders during the year representing money actually retained by the policyholders, amounted to $41,118.22. In addition the company made a net profit from its insurance business of $20,323.96, and a net profit from the investment of its capital and surplus of $11,846.36. Since the company has been in business it has saved its policyholders in their premium-cost the magnificent sum of $158,033.36.

Assets and Liabilities, December 31, 1913.

Assets.

Government, county and municipal bonds	$323,417 27
Cash in bank and in office	9,914 72
Accrued interest on bonds and deposits	4,896 46
Office furniture, after deducting depreciation of 10 percent	659 45
Agents' balances in course of collection	15,368 31
Making a total of	$354,256 21

Liabilities.	
Agents' commissions, net.....	$1,665 52
Salaries	833 48
State taxes on premiums, estimated income tax and personal property tax.....	2,334 22
Fire losses in course of adjustment	3,498 73
Making total liabilities, not including re-insurance reserve, of.....	$ 8,331 95

The above statement of assets and liabilities shows a gross surplus, including capital, of $345,924.26. Under the insurance laws furniture and fixtures are not admitted as assets, and the reinsurance reserve on the business of the company, which amounts to $57,697.83, must be shown as a liability, and after deducting these items from the gross surplus the absolute net surplus of the company, including capital, amounted to $287,566.98.

During the year the company had fire losses amounting to $37,170.22. Since it commenced business the total fire losses paid by the company amounted to $143,579.91.

The entire directorate, consisting of Chas. H. Avery, L. G. Heinritz, James H. Beal, W. S. Elkin, Jr., Wm. C. Anderson, G. O. Young, A. O. Zwick, Lewis C. Hopp, Simon N. Jones, John D. Muir, Walter Rothwell, Geo. B. Kauffman, M. S. Kahn, E. B. Heimstreet and Frank H. Freericks, were re-elected.

In the election of Directors, Mr. Samuel C. Davis of Nashville had considerable support in securing the vote of nearly three thousand shares of stock.

The Board of Directors elected the following officers: Chas. H. Avery, President; L. G. Heinritz, Vice-President; Frank H. Freericks, Secretary and General Counsel; Geo. B. Kauffman, Treasurer; the Executive Board, Chas. H. Avery, L. G. Heinritz, Walter Rothwell, A. O. Zwick, J. H. Beal, Geo. B Kauffman, and Frank H. Freericks.

On Tuesday, February 10, there was served to the stockholders of the company present at the meeting, a stockholders' luncheon at the New Gibson Hotel, and on that occasion all had an opportunity to profit from interesting talks by Dr. Wm. C. Anderson, who discussed the late Convention of the A. D. S., from Dr. James H. Beal, with reference to the progress of the Tampa Cuba Cigar Company, and from E. B. Heimstreet, regarding the National Druggists' Home at Palmyra.

On Tuesday evening the Directors of the company were entertained by the local stockholders who gave a theater party in their honor, the evening being closed with an after theater supper at the Bismarck.

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WOMEN'S PHARMACEUTICAL ASSOCIATION.

The regular monthly meeting of the Women's Pharmaceutical Association of the Pacific Coast was held January 24, 1914, in the Assembly Hall, Pacific Building, San Francisco.

The Chairman of the Committee on Papers had prepared an elaborate program for the evening and many new points on the preparation of tincture of cudbear, prescription compounding and a serviceable label varnish were discussed. An interesting paper on Radium was presented by Dr. Barbat-Winslow, Miss Low read a paper on Emetine Hydrochloride, and Mrs. Kane presented a paper on Lloyd's Reagent. Mrs. White showed samples of Alcresta Tasteless Strychnine Tablets, Morphine and Berberine.

The following officers will serve the Association for the ensuing year: Mrs. R. R. White, President; Miss Clarissa Roehr, First Vice-President; Miss Ethel Nelson, Second Vice-President; Dr. J. E. B. Winslow, Secretary; Mrs. A. D. Kane, Treasurer.

The next meeting of the Association will be held in San Francisco, February 27, 1914.

<>

MEMBERS OF THE A. PH. A. IN U. S. HOSPITAL CORPS.*

Arias, Ernest, Field Hospital No. 4, Ft. McKinley, P. I.

Barclay, James M., Camp Downes, Manila, P. I.

Barker, Quentin J., Walter Reed, G. H., Tacoma Park, D. C.

Baum, Fred C., Military Hospital, San Juan, Porto Rico.

Beal, Walter Andrew, Jolo, P. I.

Begley, Henry L., Philippine Division, U. S. A., Manila, P. I.

Behre, John R., Sergt. H. C., U. S. A., Div. Hospital, Manila, P. I.

Benche, Carl S., Hospital Corps, U. S. A., Fort San Pedro, Iloilo, P. I.

*The Editor will be glad to receive notice of any omissions or corrections necessary.

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Both, Harold, Sergt. Hosp. Corps, U. S. A., Ft. Mills, P. I.

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Zerbin, August, 21 M St., N. E., Washington, D. C.

The Bulletin Board

To the Members of the Section on Pharmacopœias and Formularies:

The time has come when this Section should complete its plans for the meeting to be held at Detroit in August, 1914. Letter paper and envelopes have been sent to each member of the Section and the several members have acknowledged their receipt and expressed a willingness to co-operate in the plans.

Dr. Fantus promises to secure the co-operation of some medical interests and suggests a discussion on the ideal Pharmacopœia and Formulary from the physician's standpoint. One proposal has been that we present a symposium on the Pharmacopœias and Formularies of the world. This subject should undoubtedly be made a feature of the work of the Section, but it may be that with the large interest in the new editions of the U. S. P. and the N. F., our Section will be overcrowded this year with work connected with the new books.

It will be remembered that at Nashville, the retiring Chairman suggested that the Secretary compile as complete a list as possible of all pharmacopœias and formularies of the world. Mr. Raubenheimer at that meeting presented an interesting paper on formularies and showed a number of those which are used in this country and abroad. This list was afterwards carefully compiled with Mr. Raubenheimer's aid and will be published in the JOURNAL. A list of modern pharmacopœias will be found in the Digest of Comments of the U. S. P. and N. F. published by the Marine Hospital Service so that the Secretary can no doubt at the next meeting present lists which will cover the modern books in these two classes, thereby carrying out the recommendation of former Chairman Havenhill. When the Association secures its permanent buildings, a feature should undoubtedly be complete files of all modern pharmacopœias and formularies, and this list will be of assistance to the general Secretary when the time comes for purchasing such books.

It has been suggested that we discuss the scope of the two standard books, the U. S. Pharmacopœia and National Formulary. Upon mature thought, I doubt that the time has arrived when this can be discussed to any advantage. On the eve of publication of the new editions, we are not ready to plan too much detail for the next editions. Your Chairman would suggest that we bend our efforts more extensively to the *new books* for the coming year. A presentation of specimens showing all new formulas would be of interest. Papers outlining the changes in the new books in the various departments of the work would attract attention and be of value to the pharmacists and physicians of the country. The chemical side could be reviewed; that of doses and strengths, the

changes in pharmaceutical manipulation, etc., etc.

The time for each session is limited and we cannot read many papers at the meeting. We might solicit papers for criticism, although perhaps the time has not arrived for this. If we can make the meetings of the Section instructive and educational, this year's interests will be well served.

Comments are invited on these suggestions and all other recommendations will be submitted to the committee so that we can formulate plans of action.

Respectfully,
E. FULLERTON COOK, Chairman.

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AN APPEAL TO THE WOMEN MEMBERS OF THE A. PH. A.

The Women's Section is desirous of getting in touch with the needs of women pharmacists and urges each member to submit either through the JOURNAL or to the Secretary of the Section any conditions surrounding their work which the Association might help to correct.

Women members are also asked to co-operate in the work of the Women's Section by assisting the various committees and offering suggestions regarding present or new lines of work.

The Press Committee will advertise the A. Ph. A. to those whose interest should be secured. The Outlook Committee will seek new lines of endeavor for the Section and investigate all suggestions offered concerning conditions to be corrected. The duties of the Membership Committee are obvious.

While these committee appointments are limited by the Constitution and By-Laws to a few, that by no means limits the number expected to help on these committees. Rather the committee appointments are to be considered as perfunctory, as a bit of red tape necessary in any organization, but the real committees are limited only by the membership of the Section or Association.

The Committees of the Section will be found in the roster published in the January JOURNAL, and the officers of the Section will be glad to hear from all members at an early date, so that the Section may do its share to make the Detroit Convention a success.

ANNA G. BAGLEY, Secretary.

PHTHISIOPHOBIA..

Baldwin says that we are reasonably sure of the following: 1. Most adults have received some tuberculous infection. 2. From this they have acquired a variable degree of specific allergy. 3. During ordinary health the tissues repel tubercle bacilli, partly, at least, with the aid of this specific allergy. 4. Reinfection of adults is mostly a superinfection coming from the existing lesions, and due to disease, trauma, overstrain or any cause of "lowered vitality," whatever that may mean. 5. "Finally, as a corollary, adults are very little endangered by close contact with open tuberculosis, and not at all in ordinary association. Childhood is the time of infection, youth the time of superinfection, and that from extension of the primary disease. Qualify these statements as we may, it is time for a reaction against the extreme ideas of infection now prevailing There has been too much read into popular literature by health boards and lectures that has no sound basis in facts, and it needs to be dropped out or revised. More protection of children and better hygiene for adults are logically demanded, but beyond this the preachments about the danger of infection to adults in the present state of society are without justification from an experimental standpoint." The statements which we have quoted represent not one man's views, but what seems to be the growing conviction of many of the most progressive and thoughtful students of tuberculosis at the present time.—*Journal Am. Med. Assoc.*

Editorial Notes and Announcements

JAMES H. BEAL, Editor.....Scio, Ohio

All communications for insertion in the JOURNAL, or respecting advertising should be sent to the Editor.

The Association does not accept responsibility for the opinions of contributors. Offensive personalities must be avoided.

Under the rules of the Postoffice the JOURNAL can be regularly mailed only to bona-fide paid subscribers. Subscriptions and association dues should be sent to the Treasurer, H. M. Whelpley, 2342 Albion Place, St. Louis, Mo.

Requests for back numbers, and claims for missing numbers should be sent to the Editor.

Claims for missing numbers will not be allowed if sufficient notice has not been given of change of address, and in no case if received later than sixty days from the date of issue.

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REPRINTS.

If the request is made at the time copy is submitted, authors will be furnished with not to exceed 50 reprints, without cover, of papers accepted for publication in the JOURNAL.

Larger numbers of reprints will be supplied by the Stoneman Press Co. at the following prices, provided the order is received before the type has been distributed:

100 copies, 4 pages, no cover, $2.50, with cover, $4.50.

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100 copies, 8 pages, no cover, $3.50, with cover, $5.00.

200 copies, 8 pages, no cover, $4.50, with cover, $6.50.

50 copies, 12 or 16 pages, no cover, $4.00, with cover, $5.50.

100 copies, 12 or 16 pages, no cover, $5.00, with cover, $6.50.

200 copies, 12 or 16 pages, no cover, $6.50, with cover, $8.00.

Orders for reprints may be sent either to the Editor, or to the Stoneman Press Co., Columbus, Ohio.

MR. ERNEST C. MARSHALL UNITES WITH THE JOURNAL.

It affords the Editor the greatest of pleasure to be able to announce that Mr. Ernest C. Marshall, Ph. G., hitherto of Boston, Mass., but now of Columbus, Ohio, has united his fortunes with those of the JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION, and with this issue assumes his duties as Advertising Manager and Associate Editor.

Mr. Marshall is a native of Boston, Mass., where he has passed his whole life. At the age of fourteen he entered the drug business under the tutelage of Benjamin F. Stacey, who for many years was an active and honored member of the A. Ph. A. He is a graduate of the Massachusetts College of Pharmacy, has held the offices of Trustee and Vice-President of that institution, and delivered the Commencement oration in 1885. He has also been President of the Alumni Association of the College. He first joined the American Pharmaceutical Association in 1875, but relinquished his membership therein during his temporary disassociation with the profession while engaged in the public service and with outside interests, but again connected himself with the Association on resuming connection with the profession. He was a member of the Boston City Council for two years, a member of its School Board for three years and has been Institutions Commissioner and Penal Institutions Commissioner of the County of Suffolk, of which the city of Boston is almost the whole. He has been prominent in Association work, having been President of the Massachusetts State Pharmaceutical Association, of which he is a life member, of the Boston Druggists' Association, the Suffolk Drug Co., and the Suffolk Drug Club. He is a Past Master in Masonry and is a Knight Templar. He has had experience in newspaper work and in advertising for more than ten years. He has been the New England representative of the Journal of the N. A. R. D. for the past three years and has writen "The New England Letter" for the JOURNAL OF THE A. PH. A. He is a member of the Pilgrim Publicity Club, the leading organization of advertising men in New England.

Concerning Mr. Marshall's propaganda work in Boston, the Secretary of the Boston Retail Druggists' Association, Mr. C. H.

Davis writes the Journal of the N. A. R. D. as follows:

The loss of Mr. Marshall will be long felt by our association, yet we cannot help but congratulate Mr. Marshall on the position that he has accepted, and also the *Journal of the American Pharmaceutical Association* for obtaining so able an assistant. As superintendent of the propaganda department of our association, he has won for the betterment of pharmacy the good will and support of many, many physicians, reducing greatly the percentage of proprietaries prescribed, and paving the way for his successor. It was not an easy task to win the confidence of physicians for himself and those whom he was to benefit; to throw down pharmaceuticals and place in their stead those preparations that the physician, seemingly, had about forgotten ever existed. To be sure no little credit belongs to the pharmacist in our own ranks, who made and put up for him the samples for distribution. Yet who but Mr. Marshall could have won the day for us and given us the start?

Mr. Marshall's training and experience render him a valuable acquisition to the JOURNAL, and the Editor bespeaks for him the cordial and enthusiastic support of every member of the A. Ph. A. family.

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THE HOSPITAL CORPS OF THE UNITED STATES ARMY.

An Urgent Appeal to Every Pharmacist in the United States.

The American Pharmaceutical Association, backed by the pharmacists of the whole United States, have a bill now before the House introduced by Representative Hughes of Georgia as Bill H. R. No. 1, and now before the Senate, introduced by Senator Bacon of Georgia as Senate Bill S. 929. These bills are identical and their text is as follows:

A BILL

To promote the efficiency of the Hospital Corps of the United States Army.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, that the Hospital Corps of the United States Army shall constitute the enlisted personnel of the Hospital Corps now authorized by law, and shall consist of thirty sergeants major at $75 per month; three hundred sergeants, first class, at $65 per month; sergeants at $36 per month; corporals at $24 per month; cooks at $30 per month; privates, first class, at $21 per month; and privates at $16 per month, with such increase for length of service and other allowances as are or may hereafter be established by law.

As Chairman of the Committee on the Status of Pharmacists in the United States Government Service of the National Association of Drug Clerks and also as a member of the American Pharmaceutical Association, we wish to urge every pharmacist who reads this article to sit down immediately and write a brief letter and then make copies of it and send a copy to each of the members of the Committee on Military Affairs of the House and Senate and urge that *"you will please see that the bill H. R. No. 1 and S. 929 which have been fully endorsed by the surgeon-general of the U. S. army (as you will see in his last report) is offered as an amendment and placed as a "rider" on the army appropriation bill now before Congress."*

The members of the hospital corps of the U. S. army are now so poorly paid that many are leaving the service, as the positions in the regular army service pay better salaries, even the men who take care of the sick mules are better paid than those who take care of the sick soldiers. Any one who is in a position to know will readily assure you of the difficulty of getting men in the hospital corps, and after getting them the difficulty of keeping them there on account of the miserably poor pay.

Pharmacists are men of influence in every section, their stores are all in the towns and cities and each one is a nucleus around which clusters the leading sentiments and views of the community. The pharmacists not only of your state, but of the whole United States, are deeply interested in the matter. Every state government requires the pharmacist who practices pharmacy among the people to be examined and licensed by a state board and to be an excellent type of man. With the present miserable salaries given the Army Hospital Corps, as just stated above, it is very difficult to get good men and still more difficult to keep them under present conditions. The Hospital Corps of your state troops are, of course, also in this same bad shape. Your help in this matter will be very much appreciated, as we feel that present conditions are unjust to those in the military service, to the public, to the medical officers of the army and to the profession of pharmacy, which all true pharmacists wish to see secure the recognition which it deserves.

GEORGE F. PAYNE.

(For further information concerning the Hughes-Bacon bill see JOURNAL for June, 1913, p. 669, and January, 1914, p. 13.—*Editor.*)

Proceedings of the Local Branches

"All papers presented to the Association and its branches shall become the property of the Association, with the understanding that they are not to be published in any other publication than those of the Association, except by consent of the Committee on Publication."—By-Laws, Chapter X, Art. III.

Reports of the meetings of the Local Branches should be mailed to the editor on the day following the meeting, if possible. Minutes should be *plainly* written, or typewritten, with wide spaces between the lines. Care should be taken to give proper names correctly, and manuscript should be signed by the reporter.

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NASHVILLE BRANCH.

(January Social Meeting.)

One of the most enjoyable social meetings ever given by the Nashville Branch of the A. Ph. A. was the entertainment given Thursday night, January 22, in the parlors of the Y. M. C. A., which was attended by about sixty people besides the Tennessee Board of Pharmacy. Wm. R. White acted as master of ceremonies and in his introductory remarks compared the A. Ph. A. to a diamond with its many brilliant sides. The scientific, commercial, historical, practical and educational sides were all important he said, but the social side should not be neglected, and it was the object of these meetings to develop more sociability and good fellowship among the druggists and their families.

Dr. E. A. Ruddiman made a splendid address, recounting some of the pleasant happenings of the Nashville convention and telling something of the beauties and attractions of Detroit, the next convention city. He said the subject of shorter hours was one that he thought should be discussed. He felt sure the wives and families of the druggists would be as much interested as the druggists themselves.

Mr. F. W. Ward, of Memphis, President of the Tennessee Board of Pharmacy, delivered an eloquent oration which was filled with humor and pathos. He told of the splendid things accomplished by the Memphis Drug Club which sprung into existence as the result of the last State Association meeting. He highly commended the idea of the Branch in giving these social meetings.

Mr. J. E. Justice, of Clarksville, the newly appointed member of the Board of Pharmacy, told some excellent anecdotes and expressed his gratification at being present.

The following musical and elocutionary program was then rendered: Vocal solo, Mrs. Baxter Moore; recitation, Miss Lucy Davis; vocal solo, Miss Mary Louise Sharp; recitation, Miss Dorothy Clark; piano selection, Mrs. Wm. R. White; recitation, Mr. H. P. Clark; instrumental selection, Miss Bessie Johnson.

W. R. WHITE, Sec'y.

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NASHVILLE BRANCH.

(February Meeting.)

The regular meeting of the Nashville Branch of the A. Ph. A. was held at Furman Hall, February 12, with President J. O. Burge presiding.

The Entertainment Committee made a splendid report of the social meeting held at the Y. M. C. A., January 22, which was attended by over sixty people, including the members of the State Board of Pharmacy.

The committee appointed to present the claims and advantages of Nashville as a location for the A. Ph. A. Home made the following report, which will be sent to the Council for consideration:

WHEREAS, At the last annual meeting of the A. Ph. A., held in this city, the proposition to provide a permanent home for the Association was referred to the Council for further consideration; and,

WHEREAS, Efforts are now being made by other cities to secure the location of this permanent home,

Therefore, We, the members of the Nashville Branch, respectfully submit for the consideration of the Council the following reasons why the Home should be located in Nashville, Tenn.:

(1) Because Nashville offers a free site for the Home.

(2) It is about the center of population of the U. S. and within 24 hours' travel for the great majority of the pharmacists of the United States.

(3) The Climate is unexcelled for the proposed Botanical Gardens.

(4) It has the second largest facilities in the United States for printing.

(5) It is the greatest Educational center in the Central-Southern States and one of the greatest in the entire United States.

(6) It has progressive Pharmaceutical Schools for both races.

(7) It has a live growing Local A. Ph. A. Branch.
(8) It affords ample Hotel facilities for any future A. Ph. A. Conventions.
(9) It has low freight rates, proximity to needed supplies considered.
(10) Incorporated Bodies for Educational purposes on a non-profit basis, are not liable for taxation.
(11) It has been proven to have the cheapest cost of living of any city in the U. S.

Respectfully submitted,
W. R. WHITE,
S. C. DAVIS,
IRA B. CLARK,
Committee.

The subject of shorter hours was discussed at length and a state-wide movement is contemplated to interest the Pharmacists of the State in this subject.

The May meeting will be devoted entirely to this subject. W. R. WHITE, Secretary.

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NEW YORK BRANCH.

(January Meeting.)

The January meeting of the New York Branch of the American Pharmaceutical Association was held on the evening of the twelfth. The meeting opened with President C. O. Bigelow in the chair. As Secretary Hugh Craig was absent, Frank L. McCartney was requested to act in his stead.

The minutes of the previous meeting were read and approved. The Treasurer's report was also read and approved.

Chairman Louis Berger, of the Membership Committee, announced a new member for the parent association and made reference to several prospective members.

Professor W. C. Anderson, Chairman of the Committee on Legislation, reported that there was little activity in legislative matters due to adjournment of Congress for the holiday season. He stated that such legislation as had been proposed effecting the pharmacist was receiving the necessary attention.

Due to the illness of Prof. G. C. Diekman, there was no report made by the Committee on the Progress of Pharmacy.

Dr. Diner, as Chairman of the Special Committee on the Madison Square Garden Drug and Chemical Exposition, stated it was the opinion of the committee that the New York Branch should not participate in the exposition, and by a majority vote it was decided that the New York Branch of the American Pharmaceutical Association would not be officially represented. It was then pointed out that literature sent out by the promoters of the exposition indicated that the New York Branch would participate, and this resulted in a resolution being passed to the effect that such publicity was unauthorized, and the Secretary was instructed to so advise the promoters of the exposition in writing and demand that they recall and destroy such advertising matter and literature in which the name of the branch had been used, and at the same time the Secretary was instructed to communicate this information to the daily press.

Dr. Joseph Mayer, acting for the Nominating Committee, submitted the following names to be balloted on for election as officers for 1914:

For President—Dr. H. V. Arny.
For Vice-President—John Roemer.
For Secretary—F. L. McCartney.
For Treasurer—Dr. Joseph Weinstein.
For Committee Chairmen:
Education and Legislation—Dr. W. C. Anderson.
Progress of Pharmacy—Dr. G. C. Diekman.
Membership—J. H. Rehfuss.
Fraternal Relations—Louis Berger.

The committee's nominees were unanimously elected. The newly elected President was escorted to the chair, and after acknowledging the honor bestowed upon him he called for the speaker of the evening, Mrs. St. Claire M. Ransford-Gay, who read a paper on "The Pharmacopœia: Its Limitations."

Mrs. Gay expressed the opinion that the U. S. Pharmacopœia was behind the times and she attributed the decline in the professional side of the pharmacy to this fact. A great many of the drugs, chemicals and preparations of the Pharmacopœia were practically obsolete, stated the speaker, and indicated that the modern physician wanted elegant preparations which would appeal to the eye and taste, and manufacturing pharmacists recognized this fact. Mrs. Gay stated that a great deal of good would result to pharmacy if a central U. S. P. research laboratory were established. In pointing out what she considers pharmacopœial defects, Mrs. Gay asks why some elixirs were in the Pharmacopœia while others were to be found in the National Formulary; why the obsolete synthetic remedies are found in the Phar-

macopœia while those now most used are not given recognition. In conclusion, she stated that it was high time that the Pharmacopœia became modernized so that it would be used to educate physicians on new remedies.

A discussion followed, in which Messrs. Diner, Raubenheimer, Arny, Mayer and Roemer took part.

Dr. Diner agreed with Mrs. Gay in that the Pharmacopœia was many years behind the times. He stated that many pharmacists regarded the U. S. P. as a sacred book, and added that if age is any criterion, then some of the formulas contained therein are indeed quite sacred. He indicated that the pharmaceutical press could do a lot towards keeping pharmacists abreast with new developments, but at the same time thought that their editorial pages were too often compelled to sing the tune of the advertising manager.

Otto Raubenheimer stated that he could not agree with the speaker in that the U. S. P. was behind the times, and asserted "we have the best Pharmacopœia in the world today, and I am proud of it. The next one will be better yet." He pointed out that many of the newer coal tar products were not official for the reason that process patents on them had not expired. He admitted that some reformation was needed in the U. S. P. and N. F.

Dr. Joseph Mayer suggested that the Revision Committee issue lists of items to be included in the U. S. P. more frequently in order that they might be published in the pharmaceutical journals. He indicated that quite recently a large batch of U. S. P. inclusions were issued at one time, and it was his opinion that this was done with the view to avoid publicity.

Dr. H. V. Arny pointed out many of the obstacles with which the Revision Committee had to contend.

He was followed by John Roemer, who asserted that it was a vote and not a science which determined the inclusion of articles in the U. S. P. The Revision Committee rests on antiquated prejudices of 100 years ago in revising the U. S. P. He was of the impression that if the U. S. P. and N. F. were to act as a link between the physician and the pharmacist that these books must include some information useful to the physician. He indicated that the pharmacist also needed standards. He felt that the Pharmacopœia should include single drugs and chemicals and the National Formulary should embody all preparations involving a pharmaceutical process.

The Branch placed itself on record as favoring this by adopting the following resolutions:

"That the U. S. Pharmacopœia include only single Drugs and Chemicals, with standards for such, and that the National Formulary embody all preparations involving a pharmaceutical process or processes."

Mrs. Gay was formally thanked by the Branch.

Upon Dr. Weinstein's motion, it was decided that the Branch hold a joint meeting with the New York County Medical Society at an early date, and suggested that Louis Berger, Chairman of the Committee on Fraternal Relations, should direct his efforts to bring this meeting about.

Former Secretary Hugh Craig telegraphed from Chicago, "All sorts of good wishes; I am with you in spirit."

FRANK L. MCCARTNEY, Secretary.

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CHICAGO BRANCH.

(January Meeting.)

The annual election of officers, reception of new members and social evening of the Chicago Branch of the American Pharmaceutical Association occurred Tuesday evening, January 20, at the University of Illinois School of Pharmacy building, Chicago.

The newly elected officers are as follows: President, J. H. Wells; First Vice-President, W. B. Day; Second Vice-President, Wm. Gray; Third Vice-President, Maurice Miner; Secretary-Treasurer, E. N. Gathercoal. Committee Chairmen: Practical Pharmacy, I. A. Becker; Medical Relations, Dr. Bernard Fantus; Publicity, L. E. Warren; Legislation, H. C. Christensen.

The Secretary-Treasurer reported receipts during the year of $80, expenditures of $67.61, and a cash balance of $24.90. There were received 20 new members during the year. The total membership is 136, of which 86 are druggists, 17 members of pharmaceutical manufacturing houses, 14 teachers in pharmaceutical schools, four editors of pharmacy journals and the remainder chemists or engaged in allied industries.

An especial event of the evening was the welcome extended to new members. Secretary Thos. Potts introduced Mr. Hugh Craig,

recently installed Editor of the Journal of the National Association of Retail Druggists, and moved his election to membership in the Chicago Branch. The motion was carried by acclamation. Professor Day introduced Mr. H. W. Colson, Mr. J. A. Dorjahn, Mrs. Mary Zwick, Mr. George Kraemer and Mr. A. E. Anderson as new members. They were each pleasantly received by the company. Mr. Wm. Gray was congratulated upon his recent election to life membership in the A. Ph. A. Mr. Potts, in introducing Mr. Craig, took occasion to speak of the great need among retail druggists for reliable formulas covering the great number of unofficial preparations and household remedies. He spoke of the proposed A. Ph. A. Book of Recipes and said that the A. Ph. A. was derelict in not having published such a work ten years ago. He mentioned the attempt now being made by the N. A. R. D. to remedy this pressing need of the druggist by furnishing to the retail drug trade not only practicable reliable formulas for a number of household articles, but also in supplying suitable labels in small quantities at a very low price to retail druggists for these preparations.

Mr. Craig expressed his pleasure in uniting with the Chicago Branch and assured us that he expected soon to be as much at home here as he had been for seven years in the New York Branch. During the seven years in New York he had not missed a Branch meeting and this, his first meeting with the Chicago Branch in January, followed within a month of the last branch meeting in New York, his record was still intact. Mr. Craig, referring to his experience as Associate Editor of the Druggists' Circular, spoke of the great number of formulas for every variety of preparation that could possibly be used in the drug business that he had originated, "borrowed" or "stolen." He dwelt upon the fact that unless a formula went into very great detail as to the materials to be used and the methods to be followed in making a preparation, or unless the operator had an intuitive or acquired knowledge of methods, the product from the formula was usually a decided failure. In other words, the "personal equation" was the q. s." in all formulas, and unless a pharmacist had the "know how" in him the formula could but rarely put it in him.

Professor Day took occasion to review in a few words some of the accomplishments of the Branch during the last seven years. He brought out the fact that when the Branch was organized in Chicago, the city already possessed one of the strongest and most active local druggists associations in the world, the C. R. D. A.; that the N. A. R. D. maintained its headquarters here, with all of their great activity, that the social side of things pharmaceutical was ably cared for by the Social Drug Club, now known as the Chicago Drug Club, and that our city possessed the most unique of all pharmaceutical organizations, the Chicago Veteran Druggists' Association, which especially attracted the older druggists. The Chicago Branch, therefore, upon its organization, chose as its special line of work the presentation and discussion of (1) legislative matters affecting pharmacists; (2) the revision of our national standards, the U. S. P. and N. F., and (3) original or improved unofficial formulas. Much good work along each of these lines has been accomplished. In addition, the Branch usually devoted one evening each season to a popular lecture and one evening to social events.

Under the able direction of Mrs. M. M. Gray and Miss Rose Schmid, refreshments were served and the meeting adjourned with many expressions of felicitations over "an evening well spent."

E. N. GATHERCOAL, Secretary.

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CHICAGO BRANCH.

(February Meeting.)

Professor Joseph P. Remington honored the Chicago Branch of the American Pharmaceutical Association, Monday evening, February 16, with a visit and led the discussion of the evening, "Progress of Pharmacopoeial Revision." The meeting was very well attended. Many pharmacists, chemists, editors, teachers and students from the pharmaceutical schools of Chicago and vicinity, all friends and admirers of Professor Remington, were present.

Professor Remington brought out the fact that the revision of U. S. P. VIII is nearing completion and that U. S. P. IX will undoubtedly be in the hands of the publishers this year, possibly by July 1. He spoke of the large publicity being given to the work of revision and referred to the fact that

according to the wish of the 1910 convention, all changes in and additions to the text of the new pharmacopœia are to be published for comment and criticism before the matter goes to the printer. These changes and additions in the text of the chemicals has already been published (see J. A. Ph. A. for Dec., 1913), the copy of the text for the crude drugs has been sent to journals and will be published during March and April, and the material on the volatile oils and pharmaceuticals will immediately follow. The final date for the reception of criticisms by the Revision Committee will be announced with the last of the copy.

Professor Remington spoke of the inclusion of mercuric chloride tablets in the U. S. P. and the selection of the most desirable form for their administration. The subject is exceedingly important and suggestions are wanted. The definition of a "poison" has been put up to the Committee of Revision, and the professor humorously offered a prize of a five-dollar gold piece for a definition that would be acceptable to the committee. He discussed the admission to the Pharmacopœia of substances known as protected, proprietary or patented, and was inclined to oppose the admittance of such substances.

The address of Professor Remington was received with much applause. Then ensued a very interesting and profitable discussion of the address. Mr. Wilhelm Bodeman, member of the Committee of Revision, extended a welcome to Professor Remington.

Dr. Bernard Fantus, pharmacologist at the U. of I. Medical College, questioned the advisability of any tablet form, particularly a colored tablet, for dispensing bichloride, especially in view of the increasing use of candy medicaments in tablet or lozenge form.

Mr. Fred Meissner, of the U. S. P. Board of Trustees, believed that the present attention given to the dangers of bichloride tablets was largely due to newspaper notoriety and that if newspaper editors could be persuaded to omit the name of the poison in the published accounts of suicides, the danger of suicidal waves from particular poisons would be largely averted. In his extensive experience as a retail pharmacist he had never personally known of an accidental poisoning from bichloride.

Secretary Thos. Potts, of the N. A. R. D., spoke very strongly against the bichloride tablet, stating that the U. S. P. should not recognize it and that this extreme poison should never be sold except on physicians' prescription, and then only in solution.

Secretary Light, of the C. R. D. A., said that the sale of bichloride tablets could be regulated in Chicago by city ordinance just as has been done in the case of phenol, cocaine, heroin, etc. He stated that recently a newspaper reporter came to him in regard to the sale and use of heroin in Chicago, and had been informed that members of the C. R. D. A. strictly adhered to the municipal code. Later the reporter attempted to buy heroin in twenty-seven drug stores located in different sections of the city, and in every case was refused the drug.

C. P. Van Schaack, of the wholesale trade, was warmly in favor of some regulation over the sale of bichloride.

Editor Hugh Craig, of the Journal of the N. A. R. D., endorsed the idea that corrosive mercuric chloride should be sold only on physicians' prescriptions. He referred to the suicidal cycles, lately phenol, now bichloride, next something else, each fostered by newspaper notoriety. He favored the addition to the U. S. P. of definite and important medicaments, even if patented.

Professor W. B. Day referred to Dr. Cohen's famous definition of a dose, "A dose is enough," and said then that a poison might be defined as "A poison is too much."

Dr. H. M. Gordin, member of the Revision Committee, humorously defined a poison as those substances listed by a suitable committee of learned gentlemen as such. Professor Remington refused him the prize.

Professor A. H. Clark, of the Revision Committee, said that the wide divergence of opinion as brought out in the discussion of the evening on one or two topics only illustrated some of the difficulties Professor Remington, as chairman of the committee, had to overcome in harmonizing on many subjects just as great differences of opinion in the committee. He was sure that U. S. P. IX, however, will rank, as does now U. S. P. VIII, the premier pharmacopœia of the world.

Professor George D. Timmons spoke of the U. S. P. doses, which Professor Remington had criticized as of no legal value, and held that average doses were of much value to teacher and student, pharmacist and even the physician.

Professor C. W. Patterson favored the

radical regulation of the sale of bichloride tablets and expressed, he was sure, the opinion of the entire audience, his pleasure in hearing the very interesting and instructive address and discussion of the evening.

Professor C. M. Snow spoke of the very complicated formula proposed for fluidextract of squill. Professor Remington thanked him for the criticism, and again asked for comments, favorable or unfavorable, on the text as now being published, stating that such comments would invariably receive the attention of the committee.

Secretary Gathercoal, of the Chicago Branch, announced the subject of the March meeting, "The Preparation of Diphtheria Antitoxin." Dr. H. M. Letton will lead with an illustrated lecture on the subject. All present, as well as others interested in this subject in Chicago and vicinity, were invited to attend the March meeting.

He moved a vote of thanks to Professor Remington for his very generous service to the Branch on this occasion. There was a unanimous response in a rising vote.

E. N. GATHERCOAL, Secretary.

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NORTHWESTERN BRANCH.

(January Meeting.)

The January meeting of the Northwestern Branch of the American Pharmaceutical Association was held jointly with the Minneapolis Retail Druggists' Association and the Minneapolis Drug Club, in Odd Fellows' Hall, 703 Hennepin avenue, Minneapolis, on Thursday evening, January 22, at 8 p. m.

On account of the inability of President Gamble to arrive until later in the evening, Dr. Justin S. Brewer was asked to take the chair. The program consisted of the following symposium on Fungi:

1. "The Culture of the Edible Mushroom (Agaricus Campestris) as a Hobby for the Retail Pharmacist," illustrated with specimens grown by the speaker, Mr. A. J. Kline.
2. "Ergota and the Standardization of Ergot Preparations," demonstrated by the Cock's Comb Test, by Prof. H. C. Rogers.
3. "Fungus Plants and the Pharmacist," by Prof. E. L. Newcomb.

The papers presented were further illustrated with drug specimens, models of fungus plants, charts, lantern slides, etc.

Mr. Kline first gave descriptions of the more common forms of edible mushrooms and then proceeded in detail with the methods of soil preparation, culture and marketing of the crop. The speaker illustrated his talk with beautiful specimens which he, as a busy retail pharmacist, had found great pleasure in growing. The paper, which appears elsewhere in this issue, was discussed by President Gamble, Dr. Brewer and others. Mr. J. D. Smeltzer called attention to the work of the Minnesota Mycological Society and stated that pharmacists who are interested in fungi would be welcomed at the meetings of that association. Mr. Smeltzer also suggested for those interested in the subject a visit to the Lambert caves in St. Paul and a perusal of the book entitled "Minnesota Mushrooms" by Prof. Frederick E. Clements.

In discussing Ergota, Prof. Rogers first gave a description of the life history of the plant yielding the drug, followed by a consideration of the different commercial varieties and their supposed relative value. Old and new methods for the preservation of the crude drug and its preparations were given and it was stated that experiments covering probably five years should be carried out before positive assertions can be made concerning the keeping qualities of ergot preparations under vacuum conditions. In discussing the constituents, attention was called to the unstable character of amines under certain conditions. The physiologic effect of ergot upon various animals such as pigs, horses, cattle, dogs and man were referred to. The different physiologic assay methods of ergot were explained and the method of applying the cock's-comb test was given in detail after which intra-muscular injections of U. S. P. fluidextracts of ergot were made on two white leghorn roosters. The arbitrary standard dose of 1.5 cc. per Kilo was given. Both samples were freshly prepared preparations, one being made from Spanish Ergot and the other from Russian. The results as indicated by the darkening of the comb, due to the rise in blood pressure, were pointed out by comparison with a third untreated rooster and these results were said to indicate that both preparations were of excellent quality. The preparations made from the Spanish Ergot gave slightly the better test. While waiting for the reactions to take place the speaker called attention to a tabulation which he had prepared of some fifteen tests carried out at the College of Pharmacy, University of Minnesota, showing the relative value of various commercial preparations and the deterioration due to age. The simplicity

of the manufacture of the fluidextract was also demonstrated. The retail pharmacist who uses considerable fluidextract of ergot was encouraged to make and standardize his own preparations from selected drugs and it was shown that by so doing the pharmacist not only can save money, but that he can accomplish something of greater importance by insuring the physician of a uniform active medicament and at the same time demonstrate his ability, all of which will tend to raise the doctor's estimation of the druggist as a professional man.

The symposium was closed by Prof. Newcomb, who spoke briefly on a number of fungus plants of interest to the pharmacist. These were illustrated by views thrown upon the screen by means of the projection lantern. Prof. Newcomb stated that the slides were loaned by the Department of Botany of the University of Minnesota and that many of them represented accurately colored photographs of rare specimens. Among the large number of fungi illustrated the following were dwelt upon at some length: Peronospora, Aspergillus, Penicillium, Mucor, Claviceps, Ustilago, Agaricus, Amanita, Polyporus, Lycoperdon, Morchella, Coprinus etc.

Following the several papers Mr. E. V. Clark gave a short talk on the value of active membership in such organizations as were represented by the joint meeting, laying special emphasis upon the lasting qualities of educational programs such as had just been presented.

After studying the various exhibits the meeting adjourned to meet in February with the Scientific Section of the Minnesota State Pharmaceutical Association.

E. L. NEWCOMB,
Secretary, N. W. Branch, A. Ph. A.

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CINCINNATI BRANCH.

(January Meeting.)

The monthly meeting of the Cincinnati Branch A. Ph. A. was held at the Lloyd Library, January 13-14, with Prof. John Uri Lloyd as President of the meeting. The Secretary's report of the previous meeting was accepted and was favorably commented upon by the President. The exhaustive communication drafted by the Legislative Committee voicing the protest of the Branch to the enactment of the so-called Duffy act and to other proposed laws was forwarded to Governor J. M. Cox, and a most courteous reply has been received by the Secretary. The President then introduced as the subject of discussion for the evening, "Mercury and Its Salts."

Mr. Charles A. Apmeyer, in stating the historical points of the subject, said in part, that the first records as to the use of mercury are found in Theophrastus, about 325 years before Christ. Its preparation is here given as from cinnabar by means of copper and vinegar and it was called Liquid Silver. The metal was known to the Egyptians, to India, and to China. The Arabs also were much interested in Mercury, as is shown by the works of Geber, in which the metal and its compounds, red precipitate and corrosive sublimate, are described. It was used much by the Arabians for skin diseases. Dioscorides describes the production of mercury from cinnabar. Pliny also makes mention of its preparation and described its purification by squeezing it through leather. It was known then that gold and other metals were altered by mercury. This knowledge is shown by processes described for assaying gold and silver. Paracelsus and his disciples had no hesitancy in making use of mercury sublimate and the so-called Turpeth Mineral. In this way a much better knowledge of the various mercurial compounds was gradually obtained until finally investigations and experiments led up to the discovery of calomel and white precipitate, both of which were hailed as great discoveries, were highly prized as medicines and still hold an important position among medicinal chemicals. It was during this period also that it was determined that cinnabar consisted of mercury and sulphur, and that mercury was a true metal.

We do not find mercury mentioned in the Book of Moses, or in the writings of the older Greek authors. Theophrastus (300 B. B.) speaks of liquid silver or quicksilver, and says it is obtained by rubbing cinnabar with vinegar in a copper vessel. Dioscorides, in the first century, mentions this body and states that it was obtained by subliming cinnabar and charcoal in an iron pot upon which a cover was luted. Pliny, who named the material thus obtained Hydrargyrum, in contradistinction to the native mercury to which he gave the name of Argentum Vivum, was acquainted with the fact that all solid bodies, with the exception of gold, float upon the

surface of the metal. Isadorus, in the beginning of the seventh century, was acquainted with the metal as is shown by the following extract: "Argentum vivum servitur melius in vitrius vasis nam caeteras materias perforat." Mercury was well known to the older alchemists for they believed it to be one of the component parts of all metals. Native mercury is occasionally met with in globules disseminated through the native sulphide, which is the ordinary ore. This is called cinnabar. It is found in many places in the world. From investigations of Becker and Schrauf the average per cent of metal found in cinnabar was 82.2%. Statistics show that California produced, in 1850, 7,723 lbs., and in 1908, 16,984 lbs. In 1906 the United States produced 26,238 lbs,—in 1908, 19,752 lbs. In 1907 the average price per flask of 75 lbs. was $38.43, and in 1908, $41.72. The world's production of quicksilver in the years 1907-8 was:

	1907	1908
United States	734	672 flasks
Austria	610	630
Italy	680	423
Russia	130	49
Spain	1,210	1,065
Mexico	200	200

Mr. Apmeyer was followed by Dr. Dieckmeier, who spoke of the medical sides of the question. He said, "The physiological effects of all mercury salts and compounds are similar and vary only in degree according to the preparations used, with the exception of those salts of mercury in which that metal is combined with a substance having stronger toxic properties than mercury. All soluble mercury salts act on the skin and other surfaces as caustics and the insoluble salts do this as soon as they are converted by the body juices into soluble salts. Salts of mercury are of principal use for their antiseptic action, both internal and external. Mercury is principally a brain poison and in toxic cases few organs show definite pathological changes, the kidneys, bones, skin and mucus membranes being an exception.

Mercury is mostly eliminated by the intestinal tract, about 77% passing off through this channel, but all organs of the body will be found to contain some of the mercury ingested. Mercury injected into blood-vessels or sub-cutaneously is eliminated most quickly by the body, the effect of the poison administered in this way is more transitory. Mercury administered by mouth or inunction is eliminated from the system, but very slowly, its presence in the system having been ascertained a year after its administration had been discontinued. The use of the bichloride as a surgical antiseptic should be discontinued on account of its caustic properties and because other equally important but less dangerous agents are available for use.

The discovery of the Wasserman test enables us to regulate the use of mercury preparations, so as to correct dosage, and to limit administration."

Dr. A. O. Zwick followed Dr. Dieckmeier, giving a short talk upon the destructive local effects of the bichloride of mercury, after which F. W. Wiessmann gave an interesting address upon "The Construction of Substitution Products," which was received by the members with much and earnest appreciation.

CHARLES A. APMEYER, Secretary.

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CINCINNATI BRANCH.

(February Meeting.)

The regular meeting was held at Lloyd Library on February 10. President Lloyd being out of the city the duties of presiding fell upon Vice-President, Prof. Theo. D. Wetterstroem. The minutes of the last meeting were read and approved.

Prof. Theo. D. Wetterstroem read a paper on the subject of "Aspirin and Other Synthetics." He commented upon the products of different manufacturers, Hoffman, Van Heyden and others, calling particular attention to the fact of the trade name being perpetual, and described the physical and chemical properties, melting points, etc., of this synthetic drug. The discussion was participated in by Mr. L. Werner, Mr. C. G. Merrell and others.

Mr. Chas. G. Merrell took for his subject, "Sodium Salicylate." He presented the uses of same and illustrated the distinctive features between the products obtained from natural sources and that by artificial means. Notwithstanding the similarity of crystalline construction, he still prefers the sodium salicylate obtained from natural sources. He very entertainingly described his efforts in trying to secure the true herb in Pennsylvania and North Carolina, and said that most of the oil used was the Oil of Birch, which was indicated by a difference in the amount of Terpenes. Government distinguishing tests are not efficient as yet, but show im-

provement, based upon the presence or absence of Terpenes. Many other interesting points were brought out by this discussion, which were appreciated by the audience.

Miss Bertha Ott read a paper on the subject of "The Hospital Apothecary," describing the grand work accomplished, especially in hospital work in the missionary field.

Mr. Louis Werner took for his subject "Should sodium peroxide be used in the manufacture of H_2O_2?" He gave an exhaustive explanation of the various commercial methods of producing solution of peroxide hydrogen, giving the reasons for the production of cheap grades of this preparation, and stated, among other things, that one of the most important methods is that of burning metallic sodium in a stream of pure oxygen, or air free from nitrogen and carbon dioxide. This operation is best carried out in aluminum vessels and the gases must be thoroughly dried.

He described another commercial process conducted by burning slices of sodium resting upon trays of aluminum in a tubular vessel. In this it comes in contact with a current of air, which has been freed from carbon dioxide, and is maintained at a temperature between 300° to 400°. The oxide formed when thrown into water decomposes in part, in consequence of the heat developed, and gives sodium hydrate and oxygen. By careful cooling much of it can be dissolved. As metallic sodium, made by the electrolytic process is rather inexpensive, this forms a very desirable commercial method of manufacture.

Another process depends upon the ignition of sodium hydroxide, sodium oxide or sodium nitrate in an atmosphere of oxygen. This process is varied sometimes by dropping metallic sodium into fused sodium nitrate.

In order to make hydrogen peroxide from sodium peroxide, it is merely necessary to dissolve the sodium peroxide in ice cold water and neutralize with hydrochloric or sulphuric acid.

In making the solution of the peroxide, if the temperature is allowed to rise, the peroxide is decomposed by water, giving oxygen and sodium hydroxide.

In this process the peroxide solution is contaminated with sodium chloride. In order to avoid the presence of sodium salts, which would cause the non-volatile residue to exceed that allowed by the U. S. P., hydrofluosilicic acid is used, which forms an insoluble sodium salt.

Another method is first to treat an ice-cold solution of sodium peroxide with hydrofluoric acid. This solution is then treated with aluminum fluoride, which forms an insoluble double salt with the sodium fluoride.

Another method is to treat the ice-cold solution of sodium peroxide with dilute sulphuric acid, and then subject the mixture to fractional distillation, *in vacuo*. In this way the H_2O_2 is distilled off from the sodium sulphate and can later be diluted to the strength desired.

Mr. Werner's admirable paper was favorably commented upon.

Mr. Otto Katz, to whom had been assigned the subject "Dosage and Effects of Aconitine," said in part that DuQuesnal first obtained Aconitine in crystalline form in 1871, but Geiger and Hesse had applied the name Aconitine in 1833 to an amorphous base, obtained from the root of Aconitum Napellus.

After describing the physical and chemical properties of this most powerful drug, he passed to the dosage, giving the same as from 1/200 to 1/100 of a grain. He cites, however, a case where two grains have been given with no untoward effect, while 1/100 grain has caused death, which shows the uncertainty of dosage and the extreme care which must be employed in dispensing this powerful poison. He also calls attention to the local use of Aconitine, as in the form of oleate aconitine, and warned against the use of same, especially upon abraded surfaces. After moderate toxic doses the prominent symptoms are great disturbance of the respiration, muscular weakness, vascular depression and finally death, with or without convulsions. Given to a rabbit by injection of 1/6 to a 1/4 gr. the animal commences to jump vertically in a very peculiar manner. These movements grow less and less powerful and are finally replaced by severe convulsions, during which the animal lies prostrate on its side. In the dog, however, the muscles have remained without a quiver during all stages of the poisoning. The convulsions are an inconstant symptom, dependent upon the peculiarities of the individual or species, as well as the amount injected. Dilatation of the pupil very frequently occurs, if it be not indeed a constant phenomenon.

The symptoms, which are induced by small therapeutic doses of aconitine in man, are re-

duction of the force and frequency of the circulation, a sense of muscular inertia and weakness and a slight tingling in the extremities or in the hips.

If the dose administered be large, all these symptoms are, of course, intensified.

Mr. Katz treated his subject in a very exhaustive manner, and gained the thorough appreciation of his auditors.

A general discussion ensued regarding the various papers submitted during the evening, in which Mr. C. A. Apmeyer, Mr. Chas. G. Merrell, Mr. Louis Werner and others took part. CHAS. A. APMEYER, Secretary.

The Pharmacist and the Law

ABSTRACT OF JUDICIAL DECISIONS.

MISBRANDING — ADMINISTRATIVE REGULATIONS—DRUG DERIVATIVES. Certain packages of Antikamnia Tablets, Antikamnia and Codeine Tablets, and Antikamnia and Quinine Tablets were confiscated and condemned for alleged misbranding under the Federal Food and Drugs Act. The owner petitioned to be made a defendant in the libel, which was done, and the Court of Appeals of the District of Columbia affirmed a decree of the Supreme Court of the District, dismissing the libel. The United States Supreme Court has reversed this decision and remanded the cause with directions to overrule the exceptions to the libel. The labels on the packages bore the statement that the tablets contained no acetanilide, antifebrine, antipyrine, morphine, opium, codeine, heroin, cocaine, alpha or beta eucaine, arsenic, strychnine, chloroform, cannabis indica, or chloral hydrate, and stated the number of grains of acetphenetidin, which, the owners contended, was a sufficient compliance with section 8 of the Federal Food and Drugs Act. The ground of condemnation alleged was that the packages contained a large quantity and proportion of acetphenetidin, which, it was alleged, is a derivative of acetanilide, and that under the provisions of the act and of the regulations made thereunder, it was provided and required that the label on each package should bear a statement that the acetphenetidin contained therein is a derivative of acetanilide; which the labels on the packages did not do. It was also alleged that the packages were misbranded in that the labels thereon were false and misleading, for the reason that they bore the statement that no acetanilide is contained therein, and that the statement imports and signifies that there is no quality of any derivative of acetanilide contained in the drug. The owner's exceptions averred that the act does not provide that there should be added to any derivative of any of the substances contained therein the name of the parent substance, and the act cannot be added to or enlarged by requiring the company to add to the name of a known article, the fact that the article is a derivative of any of the substances mentioned in the act. It was also averred that the statement on the labels that no acetanilide was contained in the packages was not false and misleading, but true.

Food Inspection Decision No. 112, issued January 27, 1910, by the Department of Agriculture, quotes section 8 of the act, and states that the Attorney General, in an opinion rendered January 15, 1909, held that a rule or regulation requiring the name of the specified substance to follow that of the derivative would be in harmony with the general purpose of the act, and an appropriate method by which to give effect to its provisions. In conformity to this opinion, Regulation 28 of the Rules and Regulations for the Enforcement of the Food and Drugs Act was amended as follows: "Acetanilide (antifebrine, phenylacetamide). Derivatives—Acetphenetidine * * * (g). In declaring the quantity or proportion of any of the specified substances the names by which they are designated in the act shall be used, and in declaring the quantity or proportion of the derivatives of any of the specified substances, in addition to the trade name of the derivative, the name of the specified substance shall also be stated so as to indicate clearly that the product is a derivative of the particular specified substance."

Section 3 of the Federal Pure Food and Drugs Act gives the Secretary of the Treasury, the Secretary of Agriculture, and the Secretary of Commerce and Labor, power to "make uniform rules and regulations for carrying out the provisions of the act, and the power to collect specimens of food and drugs offered in interstate and foreign com-

merce." It adopts the definitions of the United States Pharmacopœia.

It was held that the power of the Secretaries is one of regulation only—not a power to alter or add to the act. If, therefore, the quantity or proportion of the substances or any derivative or preparation of them must be stated, is it administrative of the law or additive to it to require by regulation that not only the name of the derivative or preparation be stated, but from what substance derived or of which it is a preparation? It was held that the provision was one of regulation or administration only. Furthermore, it was held that the requirement of section 8 of the act means that the label shall also state the substance from which the derivative is produced, in order to make the warning of the labels complete.—*U. S. v. Antikamnia Chemical Co.*, 34 *Supreme Court*, 222.

ANTI-TRUST ACT — INTERSTATE COMMERCE IN MEDICINES.—In an action for a balance due and owing for medicines, extracts, etc., furnished by the plaintiff to the defendant on a writen contract, the defense was that the contract was illegal and unenforceable because violative of the anti-trust laws of Texas. By the contract the plaintiff was to sell to the defendant, f. o. b. the cars at Winona, Minn., its medicines at the usual wholesale prices, less certain discounts, to be sold by him at the regular retail prices in a certain part of Texas, except in incorporated municipalities. The defendant agreed to sell no other goods except those purchased from the plaintiff while the contract remained in force, and only to customers at their residences in the prescribed district. It was held that the contract was violative of the Texas Anti-Trust Act of 1911, it clearly showing by its terms an intention to combine the capital, skill, and acts of the parties to fix and maintain a standard of prices upon a certain commodity and to prevent competition in a given territory. The sale was held to be interstate commerce, the sale of goods by a citizen in one state to a citizen in another state, the goods to be shipped from one to the other, being interstate commerce, even when the sale is made by an agent of the seller in the state of the buyer. But the fact that the sale constituted interstate commerce did not prevent the Anti-Trust Act from applying to invalidate the contract and prevent a recovery thereon. The fact that a part of the account was due and stated at the time the contract was made and that the defendant expressly agreed to pay that sum did not save that part from being illegal and unenforceable; all items of the illegal contract being invalid.—*J. R. Watkins Medical Co. v. Johnson, Texas Civil Appeals*, 162 *S. W.*, 394.

ACTION AGAINST BOARD OF PHARMACY—ITS NATURE—PARTIES.—In an action of mandamus against the Kentucky Board of Pharmacy and its members to compel the issuance of a pharmacist's certificate of registration, permitting him to practice his profession in the state, the question was whether the action must be brought in the county in which the president of the board resides; the board having no office or place of business in any county. It was held that such an action is a transitory action governed by Kentucky Civ. Code Prac., §78, requiring actions whose venue is not established by other sections of the article to be brought in the county where the defendant, or any one of several defendants, resides or is summoned, and may be brought in any county where process is executed upon the members of the board or any one or more of them. The board, not being designated a corporation by the act organizing it, is not a "corporation," and, while it is a "quasi corporation," when acting pursuant to contractual powers conferred by the act creating it, is not governed by Civ. Code Prac., §72, requiring an action of contract against a corporation having an office or place of business in a county or an agent residing therein to be brought in such county or in the county in which the contract is made or to be performed, and that an action of tort be brought in such county or the county in which it is committed. The action being to compel the performance of a ministerial duty, the members must be sued by name in order that the court may determine whether they are the proper persons to perform such duty, and in order that it may command them to perform it.—*King v. Kentucky Board of Pharmacy, Kentucky Court of Appeals*, 162 *S. W.*, 561.

OCCUPATION TAX ON TRAVELING VENDORS OF PATENT MEDICINES.—In proceedings for unlawfully following the occupation of a traveling retail peddler of patent medicines without being licensed and paying the tax required by law, the chief defense was that druggists selling patent and other medecines

at their regular places of business were not required to pay any tax. It was held that Texas Const., Art. 8, §§ 1, 2, authorizing the imposition of occupation taxes, which must be equal and uniform on the same class, empowers the Legislature to establish such classes, and Rev. Civ. St. 1911, arts. 7355, 7357, imposing an occupation tax on traveling vendors of patent medicines, is not invalid because exempting merchants and druggists selling patent medicines, for the classification is reasonable. Penal Code 1911, arts. 3, 6, provides that no person shall be punished for any act unless the same is made a penal offense and a penalty affixed by written law, and that the articles in the Penal Code and other written law may be looked to. Article 130 of the Code makes one pursuing a taxable occupation, without first obtaining a license, liable to a fine not less than the tax due. It is held that under these articles, read in connection with arts. 7355, 7357 of Rev. Civ. St., imposing an occupation tax of $100 on traveling vendors of patent medicines, and providing that the commissioners' court may levy for county revenue purposes, one-half of the state occupation tax on all occupations, prescribes a penal offense for pursuing the business of peddling patent medicines without first paying the occupation tax imposed by the statute and by the commissioners' court. The statutory provisions were held not to be void on the ground that the penalty in part may be fixed by the commissioners' court, levying a tax of one-half of that of the state for the county.—*South v. State, Texas Criminal Appeals,* 162 *S. W.,* 510.

AGENTS' AUTHORITY TO PURCHASE DRUGS—EVIDENCE.—Action was brought for the price of 250 dozen of a patent or proprietary medicine, sold and delivered to an agent of a branch house of the defendant company, which was engaged in a mercantile business. The issue was whether the agent had authority to order the drugs and bind the company for the price. It was held that evidence that the purchase involved was such a large one that it was out of the ordinary line of business of an agent of the character of the one acting for the defendant was properly excluded, in the absence of evidence bringing home to the plaintiff knowledge of the custom, especially where the defendant's vice-president had stated that the agent had authority to make the purchase in question.—*Patton-Worsham Drug Co. v. Goddard Grocery Co. (Mo.),* 162 *S. W.,* 288.

NORTH DAKOTA "ANTI-SNUFF ACT" HELD CONSTITUTIONAL.—Chapter 271 of North Dakota Laws of 1913 makes it unlawful "for any person, firm or corporation to import, manufacture, distribute, * * * or give away any snuff or substitute therefor, under whatever name called, and as defined in this act." The act defines snuff as "any tobacco that has been fermented, or dried, or flavored, or pulverized, or cut, or scented, or otherwise treated, or any substitute therefor or imitation thereof, intended to be taken by the mouth or nose. Provided, however, that ordinary plug, fine-cut, or long-cut chewing tobacco as now commonly known to the trade of this state, shall not be included in this definition." It is held that the statute is constitutional and cannot be assailed upon the ground that it deprives any person of life, liberty, or property without due process of law, or denies to any person the equal protection of the laws. In commenting upon the necessity for the statute, the court held that it could take judicial notice of the fact that the use of tobacco by the young was injurious, and that the school boy could secretly use tobacco in the form of snuff, when he would be liable to be detected in any other form of use. It could also take judicial notice of the general fear in the community that drugs and opium are, and can be, more easily mingled with snuff and be less readily detected than in other forms of tobacco.—*State v. Olson, North Dakota Supreme Court,* 144 *N. W.,* 661.

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ABSTRACT OF TREASURY DECISIONS.

CHEMICALS — MEDICINAL COMPOUNDS — ARTICLES IN PACKAGES OF 2½ POUNDS OR LESS.—All articles provided for in the dutiable schedule of the tariff act of 1913 which in fact consist of chemical or medicinal compounds, or combinations, or articles similar thereto, in packages of 2½ pounds or less, are dutiable at not less than 20 percent ad valorem under paragraph 17. This provision is a new one, and, in the opinion of the department, not only all the articles in Schedule A except soap and sponges, but all

articles elsewhere provided for in the act which in fact consist of chemical or medicinal compounds or combinations or articles similar thereto, are also subject to such minimum rate of duty when put up in such packages. —(*T. D.* 34035.)

DRAWBACKS ON MEDICINAL PREPARATIONS. —Drawbacks have been allowed on the following medicinal preparations:

Tobias Liniment, manufactured by O. H. Jadwin & Sons (Inc.), New York, N. Y., with the use of domestic tax-paid alcohol.—(*T. D.* 34068).

Medicinal and toilet preparations and flavoring extracts manufactured by Dr. Ward's Medical Co., of Winona, Minn., with the use of domestic tax-paid alcohol.—(*T. D.* 34071).

Flavoring extracts manufactured by Richard Frank & Co., of New York, N. Y., with the use of domestic tax-paid alcohol.—(*T. D.* 34082).

Flavoring extracts manufactured by the Liquid Carbonic Co., of Chicago, Ill., with the use of domestic tax-paid alcohol and imported ethers, essential oils, roots, herbs, vegetable coloring matter, and acids.—(*T. D.* 34109).

T. D. 34071 (abstracted above) is extended to cover flavoring extracts manufactured by Jacob House & Sons, of Buffalo, N. Y., with the use of domestic tax-paid alcohol.—(*T. D.* 34149).

ALCOHOLIC PERFUMERY.—The merchandise known as "Lanza" perfume was assessed with duty at the rate of 60 cents per pound and 50 percent ad valorem as an alcoholic perfume under paragraph 67 of the tariff act of August 5, 1909. It was held by the Board of General Appraisers to be properly dutiable, as claimed by the importers in their protest, at the rate of 30 percent ad valorem as ethyl chloride under paragraph 21 of the said act. In view of the importance of the issue, the Treasury Department has directed appeal to be taken from this decision.—(*T. D.* 34058).

IMPORTATION OF VIRUSES, SERUMS, ETC.—LIST OF LICENSED MANUFACTURING ESTABLISHMENTS.—A list of the establishments, fifty in number, holding, on January 1, 1914, licenses under the act of 1902 for the regulation of the sale of viruses, serums, toxins, and analogous products in the District of Columbia, is issued by the Treasury Department, with the names of the several products for which licenses have been given.—(*T. D* 34060).

DRUMS — RE-IMPORTATION — GLYCERIN — CHEMICAL.—Free importation is authorized upon re-importation of drums used for the shipment of glycerin under paragraph 406, tariff act of 1913.

The Bureau of Chemistry states that from a commercial point of view a chemical may be defined as "any substance or mixture of substances of fairly definite composition obtained by chemical process used in the arts for its chemical effect either by itself or in the manufacture of other substances." (*T. D.* 34,113.)

MIXED FISH OIL—COD OIL.—Only oil which is the product of unhealthy and putrid livers of codfish and allied species, whether or not containing the entrails and other refuse parts of the fish thrown in and allowed to undergo putrefaction, is entitled to admission free of duty under paragraph 561 of the tariff act as cod oil.—(*T. D.* 34160.)

RADIOGEN-TRINKWASSER—RADIUM BROMIDE IN WATER.—Radium bromide dissolved in distilled water is entitled to free entry as "radium" under paragraph 659 of the free list, and is not properly dutiable at 25 percent ad valorem as a medicinal preparation not specially provided for under paragraph 65, act of 1909.—(*T. D.* 34052.)

ALCOHOLIC COMPOUND—CHEMICAL MIXTURE CONTAINING ALCOHOL.—To constitute a chemical mixture containing alcohol under paragraph 3, act of 1909, the chemicals themselves must form such a substantial part, without the alcohol, as to give such predominant character to the article taken as a whole.

2. If the alcohol largely predominates, and the other ingredients of a chemical nature become relatively insignificant in quantity and proportion, then the article is an alcoholic compound under paragraph 2.

3. Linalco Seele, manufactured as a base for non-alcoholic drinks, is an alcoholic compound.—*U. S. v. Kraemer* (4 *Ct. Court Appls.*, 433; *T. D.* 33858) followed. (*T. D.* 34124—*G. A.* 7527.)

Council Business

COUNCIL LETTER No. 11.

PHILADELPHIA, PA., Jan. 31, 1914.

To the Members of the Council:

Motions No. 19 (*Publication of Tentative Program for the 62d Annual Meeting*), *No.* 20 (*Election of Members; Applications Nos.* 25 *to* 33 *inclusive*), and *No.* 21 (*Approval of Report of Committee on Publication*), have each received a majority of affirmative votes.

Motion No. 22 (*Appropriation of* $100 *for Committee on Status of Pharmacists in the Government Service*). Moved by J. H. Beal, seconded by J. A. Koch, that the sum of one hundred ($100.00) dollars, or so much thereof as may be necessary, be appropriated for the use of the Committee on Status of Pharmacists in the Government Service. This appropriation has been approved by the Committee on Finance.

Motion No. 23 (*Appropriation of* $250 *for Expenses of Delegates to National Drug Trade Conference for* 1914). Moved by J. H. Beal, seconded by J. A. Koch, that the sum of two hundred and fifty ($250.00) dollars, or so much thereof as may be necessary, be appropriated for payment of the expenses of delegates to the National Drug Trade Conference during the year 1914. This appropriation has been approved by the Commitee on Finance.

Motion No. 24 (*Election of Members*). You are requested to vote on the following applications for membership:

No. 34. Henry W. Dreyfus, 4806 West End Ave., Chicago, Ill., rec. by J. H. Wells and H. M. Whelpley.

No. 35. George Waller Harrison, Railway Ave., Cypress River, Manitoba, rec. by F. E. J. Bletcher and Evelyn Nesbitt.

No. 36. Gustave Horstmann, 14 Mount Vernon Ave., Mount Vernon, N. Y., rec. by Jacob Diner and Caswell A. Mayo.

No. 37. Leopold H. Fried, 1477 Washington Ave., Bronx, New York, N. Y., rec. by A. P. Lohness and Wm. C. Anderson.

No. 38. Louis Cramer, 72 Clinton St., Saratoga Springs, N. Y., rec. by J. H. Beal and J. W. England.

No. 39. Phillip LeVert Gregory, 200 Maine St., Johnson City, Tenn., rec. by Frank S. Brown and George M. Beringer.

No. 40. Pierre Arnold Bernard, 258 W. 74th St., New York, N. Y., rec. by J. W. England and W. B. Day.

No. 41. Clyde I. Killingsworth, 32 Adams Ave., W., Detroit, Mich., rec. by Leonard A. Seltzer and A. H. Wheeler.

No. 42. Charles A. Billups, Jefferson Barracks, Missouri, rec. by E. R. Miller and H. M. Whelpley.

No. 43. Frank J. Butler, 123 N. Mell St., Pontiac, Ill., rec. by W. B. Day and A. H. Clark.

No. 44. Charles Weissmann, 2332 Highland Ave., Cincinnati, Ohio, rec. by Chas. Ehlers and Chas. A. Apmeyer.

No. 45. Walter Gordon Leacock, 2210 Gratiot St., Detroit, Mich., rec. by Wm. A. Hall and Leonard A. Seltzer.

No. 46. Constantine Diamanti Lemos, Rue Trassa, Smyrna, Asia Minor, rec. by James A. Patch and T. C. Ladakis.

No. 47. Peter S. Houston, 46 Warner St., Dorchester, Mass., rec. by Anna G. Bagley and John G. Godding.

No. 48. Frank Hamilton Shurtleff, 278 Dartmouth St., Boston, Mass., rec. by Anna G. Bagley and John G. Godding.

No. 49. Mrs. Mary Hall Zwick, 511 South Humphrey Ave., Oak Park, Ill., rec. by Mrs. M. M. Gray and W. B. Day.

No. 50. James D. Howard, Etowah, Tenn., rec. by Ira B. Clark and William R. White.

No. 51. Joseph L. Turner, care Bristol-Myers Co., 281 Greene Ave., Brooklyn, N. Y., rec. by Otto Raubenheimer and E. L. Maines.

No. 52. Clifton Henry Briggs, care Parke, Davis & Co., Detroit, Mich., rec. by Wilbur L. Scoville and H. C. Hamilton.

No. 53. Frank Merrell Best, 120 N. 3d St., Lafayette, Ind., rec. by C. B. Jordan and A. H. Dewey.

No. 54. Lea Ludwig Mrazek, 1500 West 18th St., Chicago, Ill., rec. by W. B. Day and E. N. Gathercoal.

J. W. ENGLAND,
Secretary of the Council.

415 N. 33d St.

<>

COUNCIL LETTER No. 12.

PHILADELPHIA, PA., February 19, 1914.

To the Members of the Council:

Motions No. 22 (*Appropriation of* $100 *for Committee on Status of Pharmacists in the Government Service*), *No.* 23 (*Appropriation of* $250 *for Expenses of Delegates to National Drug Trade Conference for* 1914), *and No.* 24 (*Election of Members; Applications Nos.* 34 *to* 54, *inclusive*) have each received a majority of affirmative votes.

The following communication has been received:

CAMDEN, N. J., February 17, 1914.

Mr. Joseph W. England, Secretary, Council of the American Pharmaceutical Association, Philadelphia, Pa.:

My Dear Mr. England—The protection of the public by the throwing of every possible

safeguard around the sale of bichloride of mercury tablets is rightly receiving the earnest consideration of thoughtful and progressive pharmacists. THE JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION has presented to its readers a number of timely articles and suggestions on this subject, and the most recent issue contains an editorial resume of proposed national bichloride legislation.

It is eminently proper that pharmacists should themselves solve some of the problems associated with this question of public safety. There are a number of important points associated therewith on which their judgment should be exercised in properly shaping legislation. Foremost among these is the question of the selection of a proper shape or form for bichloride of mercury tablets not intended for the administration of an internal medicinal dose; what are commonly known as antiseptic tablets.

It is certain that we may soon expect some authoritative statement, either legislative or pharmacopœial, that will designate the form or shape of such bichloride antiseptic tablets. The round disc shaped tablet that has heretofore been commonly used is too dangerous to be continued, because this shape has been almost universally used for all forms of medication as well as for confectionery and food products. There is nothing distinctive about such a shape, and its use should be discontinued for such toxic units as a bichloride antiseptic tablet. Various other shapes, such as triangular, diamond shape, clover leaf shape, pipe or cylindrical shape, cubical shape, have been proposed and advocated even to the extent of incorporating some of these in proposed legislation. The latter shape (cubical), although proposed in several of the bills now before Congress, is particularly objectionable because this form has been used for the exhibition of confectionery and many food products, and likewise for non-poisonous medicines.

The form adopted should be distinctive, so that it could not be possible to mistake it for any other form of medication or any food or confection. Of all the forms so far proposed, the one which appears to best meet this requirement is the coffin shape or casket shape tablet as originally proposed by Mr. Franklin M. Apple in a paper presented to the Pennsylvania Pharmaceutical Association meeting in 1913. This shape is so distinctive, and if the design is further embellished with the "skull and cross bones" and the word "poison," as proposed by Mr. Apple, it could not be mistaken for any other tablet. I am strongly in favor of adopting this shape exclusively for poison tablets intended for external use. Such shape should be adopted by the Pharmacopœia and protected by Congressional and State enactments.

Further, the use of this design for any other purpose than for the preparation of poison tablets for external use, *should be prohibited by such legal enactments.* This will prevent foolish imitations which would destroy the entire value and purpose of such a design.

The suggestion of Mr. Apple has been adopted on a commercial scale by the Norwich Pharmacal Company, who have likewise applied for a patent on this design and its use for poison tablets. Several interviews have been held between officers of this pharmaceutical manufacturing house and your President and Vice-President Apple, and they have very generously offered to assign to the American Pharmaceutical Association all their right, title and interest in this patent so that this form could be adopted by the Pharmacopœia, and under proper protection and free from monopoly by any one manufacturing house. They guarantee to prosecute the application for a patent and its assignment to the American Pharmaceutical Association without any expense to the Association.

It is my pleasure to transmit herewith their communication fully covering this proposition. I ask that these entire communications be promptly submitted to the Council for action.

It is a very opportune proposition by which the American Pharmaceutical Association can demonstrate its active interest in protecting the public in the dispensing of potent medicines. I recommend its prompt acceptance with an appropriate acknowledgment of the humanitarian spirit and the generous action of the Norwich Pharmacal Company in this matter. I am

Yours respectfully,
(Signed) GEORGE M. BERINGER,
President American Pharmaceutical Association."

THE NORWICH PHARMACAL COMPANY.

NORWICH, N. Y., February 16, 1914.

George M. Beringer, Ph. M., President American Pharmaceutical Association:

Dear Mr. Beringer—Confirming our recent conversation, we hereby freely tender to the American Pharmaceutical Association, for the public good, all rights and interests in our invention of a coffin-shaped antiseptic tablet, having embossed on one side the word "Poison" and on the reverse the emblem of a skull and cross-bones. This we propose to make effective by assignment to your Association of all our right, title and interest in the pending application for design patent, Serial No. 801,748, and we hereby agree to bear all expense incident to the prosecution and securing of said patent.

It also gives us much pleasure to advise you that Mr. Franklin M. Apple, of Philadelphia, Pa., joins with us in placing in the hands of your Association this unique means of safeguarding the use of poisons, which idea first received general publicity in the pharmaceutical press through the able and timely paper read by him before the Pennsylvania Pharmaceutical Association in June, 1913.

We are led to voluntarily relinquish our

rights to this invention because we believe that the humanitarian purpose of safeguarding human life against accidental poisoning demands that there should be one form which will be universally recognized as distinguishing the virulent poison. This the coffin-shaped tablet will do. It has never before been used either for compressed tablets, confectionery or like purposes; its surfaces are rough to the touch and its appearance is so suggestive and forbidding that no wrapping in paper is necessary to declare its dangerous character.

With the control of the invention in the hands of a national association representing your splendid profession, and safe from monopolistic use by any manufacturer, it may properly be included in the pharmacopœial requirements for antiseptic tablets. We believe further that under these circumstances, uniform national and state legislation should be urged by all the drug interests to make illegal the use of this form or design for any other purpose than the exhibition of bichloride or like potent poisons.

Our assignment to your Association carries no conditions except that we reserve to ourselves the right of manufacturing these tablets, to be enjoyed in common with all other manufacturers under such regulations as your Association may adopt to fully protect your rights under the U. S. Patent laws.

We enclose herewith a copy of the assignment which we are ready to execute and also a copy of letter from our attorneys, which explains and confirms our purpose to protect your Association from all possible expense or litigation in connection with this matter. This assignment might be deferred until the patent has been granted or the subject fully disposed of, except for the fact that prompt action seems imperative to forestall hasty and ill-advised legislation, lacking uniformity and possibly requiring various forms which might add to existing dangers through their similarity to form at present in use for tablets internally administered or for confectionery.

We are sure that prompt action may be taken by your Council, as we believe no firm or corporation would place any obstacles in the way of granting a patent upon this particular design, in view of the laudable purpose for which it is to be used, as understood by yourself and Mr. Apple and in furtherance of the broad humanitarian purposes of your Association.

Sincerely yours,

THE NORWICH PHARMACAL COMPANY,
(Signed) R. C. STOFER,
President."

"VICTOR J. EVANS & CO.,
Victor Building, 724-726 9th St. Northwest,
WASHINGTON, D. C., February 13, 1914.

The Norwich Pharmacal Co., Norwich, N. Y.:

Gentlemen—Enclosed please find form of assignment of your application for Design Patent, Serial No. 801,748.

In reply to your inquiry, it is quite permissible to assign applications for patents, and, in fact, it is the ordinary procedure, excepting that your purpose is of a very unusual character.

We fully understand your instructions, namely, the above design patent is to be prosecuted and obtained at your expense; all bills for our services will, therefore, be rendered to you as usual.

Yours very truly,
(Signed) VICTOR J. EVANS & CO."

"ASSIGNMENT.

Whereas, William P. McNulty, a citizen of the United States, residing at Norwich, in the County of Chanango and State of New York, has invented a new, original, and ornamental design for a Poison Tablet, for which he filed an application for design patent of the United States, on the 18th day of November, 113, Serial No. 801,748; and

Whereas, The Norwich Pharmacal Company, Inc., duly incorporated under the laws of the State of New York, and doing business at Norwich, in the County of Chanango and State of New York, has acquired the entire interest in said invention and in and to the Letters-Patent of the United States to be obtained therefor; and

Whereas, The American Pharmaceutical Association, Inc., duly incorporated under the laws of the State of ..... and doing business at ....., in the County of ..... and State of ....., is desirous of acquiring an interest in said invention and in and to the Letters-Patent of the United States to be obtained therefor;

Now, therefore, Be it known that for and in consideration of the sum of one dollar, to us in hand paid, the receipt of which is hereby acknowledged, and other valuable consideration, the said The Norwich Pharmacal Company, have sold, assigned and set over, and do by these presents hereby sell, assign and set over unto the said American Pharmaceutical Association, Inc., its successors and assigns, the entire right, title and interest in and to the said design and in to the Letters-Patent of the United States which may be granted therefor; and we do hereby authorize and request the Commissioner of Patents to issue the said Letters-Patent to the said American Pharmaceutical Association, Inc., in accordance with this assignment.

In Testimony Whereof, we have hereunto set our hand and affixed our seal this ..... day of ....., 1914.

.....,
President.

Witness:

.....

J. W. ENGLAND,
Secretary of the Council.
415 North Thirty-third Street.

UNITED STATES PUBLIC HEALTH SERVICE.

PROMOTIONS.

Passed Assistant Surgeons John M. Holt, Robert L. Wilson and John T. Burkhalter, promoted and commissioned as Surgeons, effective Dec. 1, 1913. Feb. 3, 1914.

BOARDS CONVENED.

Board of medical officers convened to meet at Detroit, Mich., for the re-examination of alien John A. Peterson. Detail for the board: Senior Surgeon H. W. Austin, chairman; Assistant Surgeon Joseph Bolten, member; Acting Assistant Surgeon K. L. Weber, recorder.

Board of commissioned medical officers convened to meet at the U. S. Marine Hospital, Stapleton, N. Y., Monday, Feb. 23, 1914, for the purpose of making the physical examination and conducting the mental examination of Assistant Surgeon Carlisle P. Knight to determine his fitness for promotion to the grade of Passed Assistant Surgeon. Detail for the board: Senior Surgeon G. W. Stoner, chairman; Passed Assistant Surgeon W. M. Bryan, recorder. Jan. 16, 1914.

(List of changes of stations and duties of commissioned and other officers of the United States Public Health Service):

Irwin, Fairfax, Senior Surgeon. Authorized to proceed to Marcus Hook, Pa., when necessary for inspection and supervision of quarantine operations. Jan. 19, 1914.

Lavinder, C. H., Surgeon. Detailed for temporary duty at Hygienic Laboratory, effective Jan. 12, 1914. Jan. 12, 1914.

Foster, M. H., Surgeon. Directed to proceed to Saratoga Springs, N. Y., for the purpose of making an examination of an alien to observe the results of the grattage operation for the cure of trachoma. Jan. 19, 1914.

Schereschewsky, J. W., Surgeon. Directed to proceed to Chicago, Ill., to attend meeting of National Council of Safety, Jan. 20, 1914. Jan. 16, 1914.

Ramus, Carl, Surgeon. Granted 5 days' leave of absence on account of sickness from December 12, 1913. Jan. 19, 1914.

Currie, Donald H., Surgeon. Granted 4 months' leave of absence, with pay, from Dec. 20, 1913, and eight months' leave of absence, without pay, from Apr. 20, 1914, for service as secretary of the State Board of Health of California. Jan. 16, 1914.

Long, J. D., Surgeon. Directed to assume charge of Service Laboratory in addition to his duties in plague suppressive measures in California. Dec. 18, 1913.

Pierce, C. C., Surgeon. Detailed for temporary duty at Hygienic Laboratory, effective Jan. 12, 1914. Jan. 12, 1914.

Creel, R. H., Passed Assistant Surgeon. Directed to proceed to Gulfport, Miss., and vicinity, in company with an inspector from the Bureau of Chemistry, Department of Agriculture, for the purpose of making a sanitary survey of the conditions under which oysters are grown and handled for shipment. Jan. 17, 1914.

Phelps, E. B., Professor of Chemistry. Directed to proceed from New York, N. Y., to Boston, Mass., for the purpose of supervising the investigations of sanitary administration now being conducted in Massachusetts. Jan. 19, 1914.

Brown, F. L., Pharmacist. Directed to proceed with four attendants to the Delaware Breakwater quarantine station to assist in handling personnel of steamer detained on account of smallpox. Jan. 14, 1914.

Berkowitz, M. F., Pharmacist. Relieved from duty at Philadelphia, Pa., and directed to proceed to Cairo, Ill., and report to the medical officer in charge for duty and assignment to quarters.

Gray, Ralph E., Pharmacist. Upon being relieved by Pharmacist Berkowitz, directed to proceed to Lexington, Ky., and report to Surgeon John McMullen for duty in field investigations of trachoma. Jan. 19, 1914.

White, J. H., Surgeon. Authorized to proceed to Chicago, Ill., Feb. 7, 1914, to attend meeting of the Committee of the American Medical Association. Jan. 27, 1914.

Carrington, P. M., Surgeon. Directed to proceed to San Francisco, Cal., when necessary, in the investigation of the migration of tuberculous persons in interstate traffic. Jan. 20, 1914.

Woodward, R. M., Surgeon. Granted 2 months' leave of absence from Jan. 19, 1914, on account of sickness. Jan. 19, 1914.

Wertenbaker, C. P., Surgeon. Authorized to accompany battleship Ohio from Charleston quarantine station to the Delaware Breakwater quarantine station and thence to the League Island Navy Yard, Philadelphia, Pa. Jan. 24, 1914.

Lavinder, C. H. Directed, at the request of the Commissioner General of Immigration, to make an examination of an alien, Elje Hoffman, now undergoing treatment at Garfield Hospital. Jan. 24, 1914.

Grubbs, S. B., Surgeon. Directed to proceed, at such times as may be necessary, to Boston, Mass., for observation and consultation regarding re-examination of aliens at that port. Jan. 23, 1914.

von Ezdorf, R. H., Surgeon. Directed, on request of the State Board of Health of North Carolina, to proceed to Raleigh, N. C., for conference and to devise plans for anti-malaria investigations in that state during the coming season. Also directed to stop at Columbia, S. C., en route, to attend the meeting of the Southeastern Sanitary Association to be held there Feb. 12-13, 1914. Jan. 27, 1914.

Robinson, D. E., Surgeon. Directed to proceed to Washington, D. C., and report to the Director of the Hygienic Laboratory for temporary duty precedent to special field studies of tuberculosis. Jan. 26, 1914.

Wille, C. W., Surgeon. Granted 3 days' leave of absence from Jan. 28, 1914. Jan. 27, 1914.

Lloyd, B. J., Surgeon. Directed to confer with secretary, Washington State Board of Health, relative to typhoid fever outbreak. Also to visit cities in the vicinity of Seattle, Wash., on business in connection with measures taken for the suppression of bubonic plague. Jan. 22, 1914.

Boggess, John S., Surgeon. Leave of absence for 1 month from Jan. 1, 1914, amended to read "1 month's leave of absence from Jan. 13, 1914." Jan. 22, 1914.

Roberts, Norman, Passed Assistant Surgeon. Detailed for duty at the state quarantine station, Marcus Hook, Pa., in connection with the fumigation of vessels and quarantine operations on the Delaware river. Jan. 24, 1914.

Collins, G. L., Passed Assistant Surgeon. Directed to proceed to Hindman, Ky., and report to Surgeon John McMullen for duty in connection with the prevention of trachoma. Jan. 21, 1914.

Ridlon, J. R., Passed Assistant Surgeon. Detailed for duty at Philadelphia, Pa., under Senior Surgeon Fairfax Irwin. Jan. 24, 1914.

Gillespie, J. M., Assistant Surgeon. Relieved from duty at Hongkong, China, and directed to proceed to San Francisco quarantine, Angel Island, Cal., and report arrival to Bureau. Jan. 21, 1914.

Watkins, J. A., Assistant Surgeon. Granted 5 days' leave of absence from Jan. 16, 1914, on account of sickness. Jan. 24, 1914.

Brown, F. L., Pharmacist. Granted 2 days' leave of absence, Jan. 24-25, 1914. Jan. 23, 1914.

Stoner, G. W., Senior Surgeon. Granted 6 days' leave of absence, beginning Jan. 24, 1914, under paragraph 193, Service Regulations. Jan. 29, 1914.

Lumsden, L. L., Surgeon. On request of the State Board of Health of Maryland, directed to proceed to Rockville, Md., and make an investigation of the origin and prevalence of typhoid fever in that town and vicinity. Feb. 2, 1914.

Frost, W. H., Passed Assistant Surgeon. Directed after completion of duties in Pittsburgh, Pa., to proceed to Bureau for conference relative to investigations of pollution of Ohio river. Jan. 28, 1914.

Fairbanks, G. D., Acting Assistant Surgeon. Leave of absence for 15 days from Jan. 10, 1914, amended to read, "12 days' leave of absence from Jan. 10, 1914." Jan. 24, 1914.

Hamilton, H. J., Acting Assistant Surgeon. Granted 2 days' leave of absence from Jan. 31, 1914. Jan. 30, 1914.

Letton, H. P., Sanitary Engineer. On request of the State Board of Health of North Carolina, directed to proceed via Raleigh to Clinton, N. C., to advise with the authorities as to the best source of a public water supply. Jan. 29, 1914.

LaGrange, J. V., Pharmacist. Granted 4 days' leave of absence, Jan. 24, 26, 27 and 28, 1914. Feb. 2, 1914.

Glennan, A. H., Assistant Surgeon General. Granted 9 days' leave of absence on account of sickness under paragraph 209, Service Regulations. Feb. 9, 1914.

Banks, C. E., Senior Surgeon. Granted 4 days' leave of absence from Feb. 20, 1914. Feb. 6, 1914.

Guiteras, G. M., Surgeon. Relieved from duty at Galveston, Tex., and directed to proceed to Key West, Fla., and assume charge of the Marine Hospital at that port. Feb. 4, 1914. Granted 1 month's leave of absence from date of relief at Galveston, Tex.

Nydegger, J. A., Surgeon. Leave of absence for 1 month from Jan. 8, 1914, on account of sickness, amended to read, "27 days'

leave of absence from Jan. 8, 1914, on account of sickness." Feb. 6, 1914.

Anderson, J. F., Surgeon. On request of the State Board of Health of Kentucky, directed to proceed to Richmond, Va., Feb. 10, 1914, for conference with the Commissioner of Health, and for the purpose of presenting an address before the Medical College of Virginia on "Recent Advances in the Study of the Exanthemata." Feb. 9, 1914.

Bahrenburg, L. P. H., Surgeon. Directed to relieve Surgeon G. M. Guiteras and assume charge of all work of the Service carried on at Galveston, Tex. Feb. 4, 1914.

Wilson, R. L., Surgeon. When relieved from duty in charge of the Galveston quarantine station, by Passed Assistant Surgeon H. M. Manning, directed to proceed to Ellis Island, N. Y., for assignment to duty. Granted 21 days' leave of absence when relieved by Past Assistant Surgeon Manning. Feb. 9, 1914.

Manning, H. M., Passed Assistant Surgeon. When relieved from duty in charge of the Marine Hospital at Key West, Fla., directed to proceed to the Charleston quarantine station and assume charge of the Service at that port. Feb. 4, 1914.

deValin, Hugh, Passed Assistant Surgeon. Directed to proceed to Philadelphia, Pa., for inspection of unserviceable property in charge of Senior Surgeon Fairfax Irwin. Feb. 6, 1914.

Kolb, L., Passed Assistant Surgeon. Granted 4 days' leave of absence returning to station at Ellis Island, N. Y. Feb. 4, 1914.

Gillespie, J. M., Assistant Surgeon. Directed to proceed from San Francisco, Cal., to Washington, D. C., and report to the Director of the Hygienic Laboratory for duty. Feb. 5, 1914.

Carmelia, F. A., Assistant Surgeon. Relieved from duty at Ellis Island, N. Y., and directed to proceed to Galveston, Tex., and report to Surgeon L. P. H. Bahrenburg for duty. Feb. 4, 1914. Granted 3 days' leave *en route* to station. Feb. 9, 1914.

Frank, Leslie, Sanitary Engineer. Directed to proceed from Colgate, Md., to Washington, D. C., and report to the Director of the Hygienic Laboratory for conference and instructions. Feb. 4, 1914.

Streeter, Harold W., Sanitary Chemist. Directed to proceed from Baltimore, Md., stopping at Washington, D. C., for conference, to Cincinnati, Ohio, and report to Passed Assistant Surgeon W. H. Frost for duty in the investigations of the pollution of the Ohio river. Feb. 7, 1914.

Smith, E. E., 2nd Sanitary Bacteriologist. Directed to proceed from Madison, Wis., by way of Cincinnati, Ohio, to Pittsburgh, Pa., for duty in the investigations of the pollution of the Ohio river. Feb. 5, 1914.

Brown, F. L., Pharmacist. Granted 1 day's leave of absence, Feb. 12, 1914. Feb. 10, 1914.

Iltis, George W., Pharmacist. Granted 4 days' leave of absence from Jan. 17, 1914, under paragraph 214, Service Regulations. Jan. 27, 1914.

Wolfe, J. A., Pharmacist. Relieved from duty at the Pensacola (Fla.) quarantine station and directed to proceed to Philadelphia, Pa., and report to Senior Surgeon Fairfax Irwin for duty. Feb. 4, 1914.

Cofer, L. E., Assistant Surgeon General. Directed to proceed to New York, N. Y., for the purpose of delivering an address before the Medical Society of New York, at the New York Academy of Medicine on the subject "National Quarantine." Also to visit the Marine Hospital, Stapleton, N. Y., to ascertain the necessity for additional attendants. Feb. 10, 1914.

White, J. H., Surgeon. Granted 5 days' leave of absence from Feb. 18, 1914. Feb. 17, 1914.

Woodward, R. M., Surgeon. Leave of absence for 2 months from Jan. 19, 1914, on account of sickness, amended to read "2 months' leave of absence from Jan. 19, 1914." Feb. 17, 1914.

Cumming, H. S., Surgeon. Directed to utilize the S. S. Bratton in investigations of the pollution of navigable tidal waters of Maryland and Virginia, in so far as possible, for laboratory and investigation purposes. Also to proceed overland, or detail assistants for like duty, from Washington to points on the Chesapeake bay watershed to make sanitary surveys and obtain needed laboratory supplies. Feb. 11, 1914.

McMullen, John, Surgeon. On request of the Secretary of the State Board of Health of Indiana, detailed to attend the meeting of the Indiana Sanitary and Water Supply Association to be held in Indianapolis, Ind., Feb. 26-27, 1914. Feb. 17, 1914.

Goldberger, Jos., Surgeon. Directed to proceed to Savannah and Milledgeville, Ga., and Spartanburg, S. C., to inspect the opera-

tions of the Service in respect to pellagra investigations at those points. Feb. 17, 1914.

Schereschewsky, J. W., Surgeon. Detailed to attend the meeting of the New York State Ventilation Commission, to be held in New York City, Feb. 17-18, 1914. Also to visit the American Museum of Safety and investigate safety devices intended for protection of those engaged in different occupations. Feb. 17, 1914.

Wilson, R. L., Surgeon. At the request of the President of the Georgia State Industrial College, Savannah, Ga., detailed to attend the Farmers' Conference to be held at Savannah, Ga., Feb. 18-19, 1914, for the purpose of delivering two lectures on tuberculosis. Feb. 11, 1914.

Frost, W. H., Passed Assistant Surgeon. On request of the Secretary of the State Board of Health of Indiana, detailed to attend the meeting of the Indiana Sanitary and Water Supply Association to be held in Indianapolis, Ind., Feb. 26-27, 1914. Feb. 17, 1914.

Slaughter, W. H., Assistant Surgeon. Directed to report to the Commanding Officer of the U. S. Revenue Cutter Seneca for duty in connection with the ice patrol in the North Atlantic Ocean. Feb. 13, 1914.

Gahn, Henry, Pharmacist. Relieved from duty at the Purveying Depot, Washington, D. C., and directed to proceed to New Orleans, La., and report to the medical officer in charge of the Marine Hospital for duty and assignment to quarters. Feb. 13, 1914.

Miller, Charles, Pharmacist. Relieved from duty at the Marine Hospital, New Orleans, La., and directed to proceed to Key West, Fla., and report to the medical officer in charge of the Marine Hospital for duty and assignment to quarters. Feb. 13, 1914.

Spangler, L. C., Pharmacist. Relieved from duty at the Bureau, and directed to report to Assistant Surgeon General W. G. Stimpson for duty in the Purveying Depot, Washington, D. C. Feb. 14, 1914.

Ryder, L. W., Pharmacist. Relieved from duty at the Hygienic Laboratory, Washington, D. C., and directed to proceed to Mobile, Ala., and report to the medical officer in charge of the Marine Hospital for duty and assignment to quarters. Feb. 10, 1914.

Iltis, G. W., Pharmacist. Relieved from duty at the Marine Hospital, Key West, Fla., and directed to proceed to the Pensacola quarantine station and report to the medical officer in charge for duty and assignment to quarters. Feb. 13, 1914.

Keen, W. H., Pharmacist. Relieved from duty in connection with plague suppressive measures in California, and directed to proceed to Washington, D. C., and report at the Bureau for duty. Feb. 13, 1914.

Ritter, Clyde, Pharmacist. Relieved from duty at the Marine Hospital, Vineyard Haven, Mass., and directed to proceed to Washington, D. C., and report to the Director of the Hygienic Laboratory for duty. Feb. 10, 1914.

RUPERT BLUE,
Surgeon General.

Changes of Address

All changes of address of members should be sent to the General Secretary promptly.

The Association will not be responsible for non-delivery of the Annual Volume or Year Book, or of the JOURNAL unless notice of change of address is received before shipment or mailing.

Both the old and the new address should be given, thus:

HENRY MILTON,
From 2342 Albion Place, St. Louis, Mo.
To 278 Dartmouth St., Boston, Mass.

Titles or degrees to be used in publications or in the official records should be given, and names should be *plainly* written, or typewritten.

<>

ALPERS, W. C.,
From City Island, N. Y.
To 14th and Central Ave., Cleveland, Ohio.

BAILEY, FREDERICK.
From 142 First St., Lowell, Mass.
To 65 Merrimack St., Lowell, Mass.

BREWER, H. D.,
From 19 Oxford St., Worcester, Mass.
To 4 Congress St., Worcester, Mass.

BROWN, A. E.,
From Jolo, P. I.
To Attending Surg., Office (Estado Major), 17 Nebraska, Manila, P. I.

BURDETTE, B. C.
From McLean Hospital, Waverly, Mass.
To 38 High St., Clinton, Mass.

CRAWFORD, A. E.,
From Stanford Univ., Cal.
To Stanford Med. School, San Francisco, Cal.

DE COSTER, H. W.
From 304 Boston St., Lynn, Mass.
To P. O. Box 145, Lynn, Mass.

DOOLITTLE, R. E.,
From Washington, D. C.
To 109 Hillside Ave., Glen Ridge, N. J.

ELDRED, FRANK R.,
From 3323 Kenwood Ave., Indianapolis, Ind.
To 3325 Kenwood Ave., Indianapolis, Ind.

ESTABROOK, H. A.,
From Fitchburg, Mass.
To Cor. Main and Prichard Sts., Fitchburg, Mass.

FENDER, W. E.,
From Fort Poster, N. Y.
To Fort Adams, R. I.

GROSS, S. V. R.,
From Livingston, Montana.
To 12 No. Main St., care C. B. Hoskins & Co., Butte, Montana.

HANCE, E. H.
From Cor. Callowhill, Philadelphia, Pa.
To Cor. Marshall and Callowhill, Philadelphia, Pa.

HUGHES, JOHN R.,
From Idaho Falls, Idaho.
To residence unknown.

IRWIN, C. H.,
From Fort Stanton, N. Mexico.
To Fairport Harbor, Ohio.

JEHLIK, A. J.
From 3401 West 26th St., Chicago, Ill.
To S. W. Cor. Homan and 26th St., Chicago, Ill.

KELLEY, GUS A.,
From Boston, Mass.
To 11 School St., Dorchester, Mass.

KNABE, G. A.,
From Court Sq. and Dexter Ave., Montgomery, Ala.
To Dexter Ave. and S. Perry St., Montgomery, Ala., P. O. B. 87.

KNOWLTON, GEO. H.,
From 728 to 782 Union St., Manchester, N. H.

KUENZIG, PETER A.,
From Pittsburgh, Pa.
To 316 Atlantic Ave., McKeesport, Pa.

LILLY, J. K.,
From 1500 N. Meridian St., Indianapolis, Ind.
To 4 W. St. Joe, Indianapolis, Ind.

MILLER, E. R.
From Auburn, Ala.
To 214 N. Murray St., Madison, Wis.

O'GORMAN, T. V.,
From New York City, N. Y.
To 2009 Vallejo St., San Francisco, Cal.

PEARSON, W. A.
From 35 Poplar St., Philadelphia, Pa.
To 209 N. 50th St., Philadelphia, Pa.

PERKINS, R. L.
From ——.
To 505 Freeman St., Valparaiso, Ind.

RIESS, H. W.,
From Detroit, Mich.
To Office Div. Surgeon, 2d Div., Texas City, Texas.

ROSE, MARTIN,
From Ft. Barry, Cal.
To Vancouver Barracks, Wash.

SCHLOSSER, PETER,
From 132 Chestnut St., Louisville, Ky.
To 639 Second St., Louisville, Ky.

SCHRODT, JACOB,
From Live Oak and Elm Sts., Dallas, Tex.
To 2000 Elm St., Cor. Harwood, Dallas, Tex.

SEYFERT, PAUL.
From ——, Wis.
To Bradentown, Fla.

SHARMAN, HERBERT,
From Ft. Sill, Okla.
To residence unknown.

SMITH, CARL E.,
From San Francisco, Cal.
To residence unknown.

STUART, MRS. H. A.,
From 2609 3d Ave. S., Minneapolis, Minn.
To 3321 3d Ave. S., Minneapolis, Minn.

VORDICK, A. H.,
From 2329 Herbert St., St. Louis, Mo.
To 6351 Berlin Ave., St. Louis, Mo.

WHEELER, A. A.
From 873 Vermont, Ave., Detroit, Mich.
To 1050 Lawton Ave., Detroit, Mich.

WILLIAMS, S. W.,
From care Bauer & Black, Chicago, Ill.
To 5415 East End Ave., Chicago, Ill.